

**VOLUME I OF II**

**FINAL**  
**ENVIRONMENTAL ASSESSMENT**  
**FOR**  
**CAPITAL IMPROVEMENT PROJECTS**

**BUCKLEY AIR FORCE BASE, COLORADO**



*Prepared by*

Headquarters Air Force Center for Environmental Excellence  
Project Execution Division

March 2006

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**FINDING OF NO SIGNIFICANT IMPACT  
PROPOSED CAPITAL IMPROVEMENT PROJECTS**

**BUCKLEY AIR FORCE BASE, COLORADO**

**AGENCY:** United States Air Force (USAF), 460th Space Wing (SW).

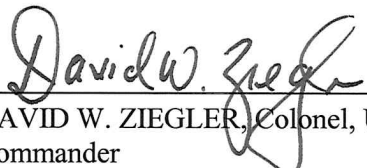
**BACKGROUND** Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, Council on Environmental Quality NEPA implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), and Air Force NEPA implementing regulations (32 CFR 989), the USAF 460 SW conducted an assessment of the potential consequences of proposed infrastructure Capital Improvement Projects (CIP) at Buckley Air Force Base (BAFB) that are described below in the Proposed Action.


**PROPOSED ACTION:** The USAF proposes numerous infrastructure CIPs at Buckley AFB. Within the CIPs, eight (8) Area Development Plans (ADP) would encompass approximately 650 acres of land at various locations within the BAFB boundaries. The ADPs would include construction of various buildings and facilities, including new housing, dormitories, an entrance gate, roadway modifications and landscaping, a community center, installation support facilities, new headquarters and recreation areas.

**FACTORS CONSIDERED IN DETERMINING THAT NO ENVIRONMENTAL IMPACT STATEMENT IS REQUIRED:** The Environmental Assessment (EA) analyzed the environmental impacts of alternatives to the proposed action taking into account all relevant environmental resource areas and conditions. The USAF has examined the following resource areas and conditions and found that the proposed action would either have no or inconsequential impact: air quality; soils; hazardous materials/hazardous waste; historic resources; traffic/transportation; water resources; wetlands and floodplains; radon; lead-based paint; asbestos; noise; and safety and pollution prevention. Portions of the area of the ADPs that will not be disturbed by construction do contain subsurface contamination. While the Proposed Action would not have any significant effect to contaminated sites, if remedial action were required at these sites in the future, activities or occupation associated with the individual ADP project could be discontinued or limited. The Final EA for the proposed CIPs at Buckley Air Force Base, Colorado, dated March 2006, is incorporated by reference.

**PUBLIC NOTICE:** NEPA, 40 CFR 1500-1508, and 32 CFR 989 require public review of the EA before approval of the Findings of No Significant Impact (FONSI) and implementation of the Proposed Action. The public review period ended on December 27, 2005.

**FINDING OF NO SIGNIFICANT IMPACT:** Based on the requirements of NEPA, 40 CFR 1500-1508, and 32 CFR 989, I conclude the environmental effects of the Proposed Action are not significant, and therefore, an environmental impact statement will not be prepared. A notice of availability for public review was published in the Denver Post on November 27, 2005 indicating a 30-day review period. A hard copy of the Draft EA and Draft FONSI was placed in the Denver, Aurora and Boulder public libraries for dissemination. The signing of this FONSI completes the USAF Environmental Impact Analysis Process (32 CFR 989).

  
\_\_\_\_\_  
DAVID W. ZIEGLER, Colonel, USAF  
Commander

  
\_\_\_\_\_  
Date

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**COVER SHEET**  
**ENVIRONMENTAL ASSESSMENT**  
**FOR PROPOSED CAPITAL IMPROVEMENT PROJECTS**  
**AT BUCKLEY AIR FORCE BASE (AFB), COLORADO**

Prepared by  
Headquarters Air Force Center for Environmental Excellence  
Project Execution Division  
Brooks Air Force Base, Texas 78235-5122

- a. **Responsible Agency:** United States Air Force (USAF), 460th Space Wing (SW), Buckley Air Force Base (AFB), Colorado
- b. **Proposed Action:** The USAF proposes numerous infrastructure Capital Improvement Projects (CIPs) at Buckley AFB. Within the CIPs, eight (8) Area Development Plans (ADPs) would encompass approximately 650 acres of land at various locations within the AFB boundaries. The ADPs would include construction of various buildings and facilities, including new housing, dormitories, an entrance gate, roadway modifications and landscaping, a community center, installation support facilities, new headquarters and recreation areas.
- c. **Inquiries regarding this document should be directed to:** Ms. Janet Wade, Environmental Flight Chief, 460 CES/CEV, 660 South Aspen Street, Stop 86, Buckley AFB, CO, 80011-9951, (720) 847-9187.
- d. **Privacy Advisory:** Your written or oral inquiries may be published and made available to the public. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meeting or hearings or to fulfill requests for copies of the Final EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the Final EA. However, only the name of individuals making comments and specific comments and specific comments will be disclosed. Personal home addresses and phone numbers have not been published in the Final EA.
- e. **Designation:** Final Environmental Assessment (EA)
- f. **Abstract:** The USAF has prepared this EA to evaluate the potential environmental impacts from the construction of numerous infrastructure CIPs at Buckley AFB (Proposed Action). The EA has been prepared per the National Environmental Policy Act to analyze the potential environmental consequences of the Proposed Action. The proposed CIP are required to support the 460th SW mission and improve quality of life for on-site, off-site, and retired personnel.
- The environmental resources potentially affected by the proposed action and alternatives include: air quality; expansive soils; hazardous materials; hazardous wastes; socioeconomics; utilities; biological resources; traffic/transportation; water resources; radon, safety and pollution prevention. Based on the nature of the activities that would occur during the construction and operation of the CIP Projects, the USAF has determined that insignificant or no adverse impacts to the above resources are anticipated.
- g. **A 30-day public comment period ending December 27, 2005 was provided.** Comments were received from the following agencies:
- The Colorado Department of Public Health and Environment (CDPHE), Hazardous Materials and Waste Management Air Pollution Control Division
  - Colorado Historical Society, State Historic Preservation Officer

The comments are contained in Appendix M of the EA. The comments submitted by the Colorado Historical Society, State Historic Preservation Officer provided concurrence with the EA. Comments submitted by the CDPHE Hazardous Materials and Waste Management Control Division required a response. The response letter, which document the revisions made to the EA resulting from the comments, are also included in Appendix M of the EA.

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## **ACRONYMS AND ABBREVIATIONS**

A&K	A and K
ACAM	Air Conformity Applicability Model
ACM	Asbestos Containing Materials
ACP	Application for Construction Permit
ADAL	Addition/Alteration
ADF	Aerospace Data Facility
ADP	Area Development Plan
AEDC	Aurora Economic Development Council
AF	Air Force
AFB	Air Force Base
AAFES	Army Air Force Exchange Service
AFPD	Air Force Policy Directive
AFSPC	Air Force Space Command
AFI	Air Force Instruction
AICUZ	Air Installation Compatible Use Zone Study
AID	Airport Influence District
APEN	Air Pollution Emission Notice
APZs	Accident Potential Zones
AQCR	Air Quality Control Region
AST	aboveground storage tank
BANGB	Buckley Air National Guard Base
BASH	Bird Aircraft Strike Hazard
BEA	Bureau of Economic Analysis
BCE	Base Civil Engineer
BMPs	best management practice
BX	Base Exchange
CAA	Clean Air Act
CAQCC	Colorado Air Quality Control Commission
CCR	Colorado Code of Regulations

Acronyms and Abbreviations

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CDC	Child Development Center
CDLE	Colorado Department of Labor and Employment
CDOW	Colorado Department of Wildlife
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and the Environment
CE	Civil Engineering
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CES/CEV	Civil Engineer Squadron/Environmental Flight
CFR	Code of Federal Regulations
CGP	Construction General Permit
CIP	Capital Improvement Program
CMSA	consolidated statistical metropolitan area
CNHP	Colorado Natural Heritage Program
CO	carbon monoxide
CONETSCA	Colorado Nongame, Endangered, or Threatened Species Conservation Act
COANG	Colorado Air National Guard
CU	Colorado University
CWA	Clean Water Act
CWCB	Colorado Water Conservation Board
CZ	Clear Zone
dB	decibels
DIA	Denver International Airport
DOD	Department of Defense
DMA	Denver Metropolitan Area
DOT	U.S. Department of Transportation
DNL	Day-Night Sound Level
DRCOG	Denver Regional Council of Government's
DSOC	Denver Security Operations Center
E	Extension
E-470	E-470 Toll Highway

Acronyms and Abbreviations

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EA	Environmental Assessment
EAC	Early Action Compact
ELUA	existing land use area
EO	Executive Order
EPCRA	Emergency Planning and Community Right-To-Know Act
ERP	Environmental Restoration Program
ESA	Endangered Species Act of 1973
°F	degrees Fahrenheit
FAMC	Fitzsimons Army Medical Center
FEMA	Federal Emergency Management Agency
FIP	Federal Implementation Plan
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
ft	feet or foot
ft <sup>2</sup>	square foot
ft <sup>3</sup>	cubic foot
FY	Fiscal Year (1 October through 30 September annually; for example FY04 represents 1 October 2003 through 30 September 2004)
GP	General Plan
HAP	Hazardous Air Pollutants
HAZMAT	Hazardous Materials
HMA	Housing Market Analysis
HVAC	heating, ventilating and air conditioning
HWMP	Hazardous Waste Management Plan
I	Interstate
IERP	Integrated Environmental Response Plan
INRMP	Integrated Natural Resource Management Plan
ITEs	Institute of Transportation Engineers
kV	kilovolt
kWh	kilowatt-hour

Acronyms and Abbreviations

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LBP	lead-based paint
LRT	Light Rail Transit
LU	land use
MBTA	Migratory Bird Treaty Act
MDE	Metropolitan Denver Employment
MDEDC	Metro Denver Economic Development Corporation
MFH	Military Family Housing (Privatized Housing)
mgd	million gallons per day
mg/y	million gallons per year
mmBTU/hr	million British Thermal Units per hour
mmft <sup>3</sup>	million cubic feet
MS4	Municipal Separate Storm Sewer Systems
NAAQS	National Ambient Air Quality Standards
NAF	Non-Appropriated Fund
NANSR	Non-attainment area New Source Review
NCO	non-commissioned officer
NDIS	Natural Diversity Information Source
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NOI	Notice of Intent
NO <sub>2</sub>	nitrogen dioxide
NO <sub>x</sub>	nitrogen oxides
NWI	National Wetland Inventory
ODS	ozone depleting substances
OSHA	Occupational Safety and Health Association
PB	portable building
Pb	lead



Acronyms and Abbreviations

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PBFH&U	Parsons Brinckerhoff/Felsburg Holt and Ullevig
pCi/L	picocuries per liter
PCBs	Polychlorinated Byphenyls
PL	Public Law
PM <sub>10</sub>	particulate matter less than 10 microns in size
POL	Petroleum, Oil and Lubricant
ppm	parts per million
PSD	Prevention of Significant Deterioration
QD	quantity distance
RAQC	Regional Air Quality Council
RCRA	Resource Conservation and Recovery Act
RICE	reciprocating internal combustion engines
RMA	Rocky Mountain Arsenal
ROI	Region of Influence
RTD	Regional Transportation District
RTLs	Rapid Transit Lines
RV	Recreational Vehicle
SBIRS	Space-Based Infrared System
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO <sub>2</sub>	sulfur dioxide
SO <sub>x</sub>	sulfur oxides
SPCC	Spill Prevention Control and Countermeasure
SW	Space Wing
SWPPP	stormwater pollution prevention plan
TBD	To Be Determined
tpy	tons per year
TSCA	Toxic Substances Control Act
TSDF	treatment storage and disposal facilities
TSP	total suspended particulates

Acronyms and Abbreviations

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µg/m <sup>3</sup>	micrograms per cubic meter of air
U.S.	United States
USACE	U.S. Army Corps of Engineers
USAF	United States Air Force
U.S.C.	United States Code
USCB	United States Census Bureau
USDA	United States Department of Agriculture
USDHUD	U.S. Department of Housing and Urban Development
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
UV	ultraviolet
VMT	vehicle miles traveled
VOCs	volatile organic compounds
VQ/TLF	Visitor's Quarters/Temporary Lodging Facility
WOUS	Waters of the United States
yd <sup>3</sup>	Cubic Yard
Xcel	Xcel Energy of Colorado

## **SECTION 1**

### **PURPOSE AND NEED FOR THE PROPOSED ACTION**

This environmental assessment (EA) analyzes the potential environmental impacts that may result from constructing proposed infrastructure and Capital Improvement Program (CIP) projects under the installation's General Plan (GP) at Buckley Air Force Base (AFB), Colorado. This CIP EA document has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, the NEPA implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), and United States Air Force (USAF) NEPA implementing regulations (32 CFR 989).

#### **1.1 PURPOSE AND NEED**

460th Space Wing (SW), the base host, and tenant organizations propose to construct a number of new facilities at Buckley AFB through fiscal year (FY) 2010. Construction projects have been proposed through the installation GP and its development component, the CIP. The purpose and need for this EA is to determine the cumulative impacts of implementing the Proposed Action and to meet the requirements and intent of the NEPA.

Currently, Buckley AFB installation facilities consist of approximately 193 buildings, or approximately 2.7 million gross square feet (ft<sup>2</sup>) (Buckley AFB 2005a). The facility development plan and demolition portions of the CIP identifies necessary demolitions and facility development to accommodate growth of current and planned military missions and community support requirements at Buckley AFB. Completion of the CIP projects would result in increasing facility square footage to approximately 4.8 million ft<sup>2</sup>. There are approximately 110 CIP construction and demolition projects, which include new housing, dormitories, a new entrance gate, modifications to an existing entrance gate, roadway modifications and landscaping, a community center, installation support facilities, new headquarters and recreation areas are planned to meet these objectives. The majority of the projects would be concentrated within eight proposed Area Development Plans (ADP) involving approximately 640 acres of land located predominantly in the northwest half of the installation. ADPs are conceptual planning boundaries overlaid on the existing layout of Buckley AFB. The planning areas

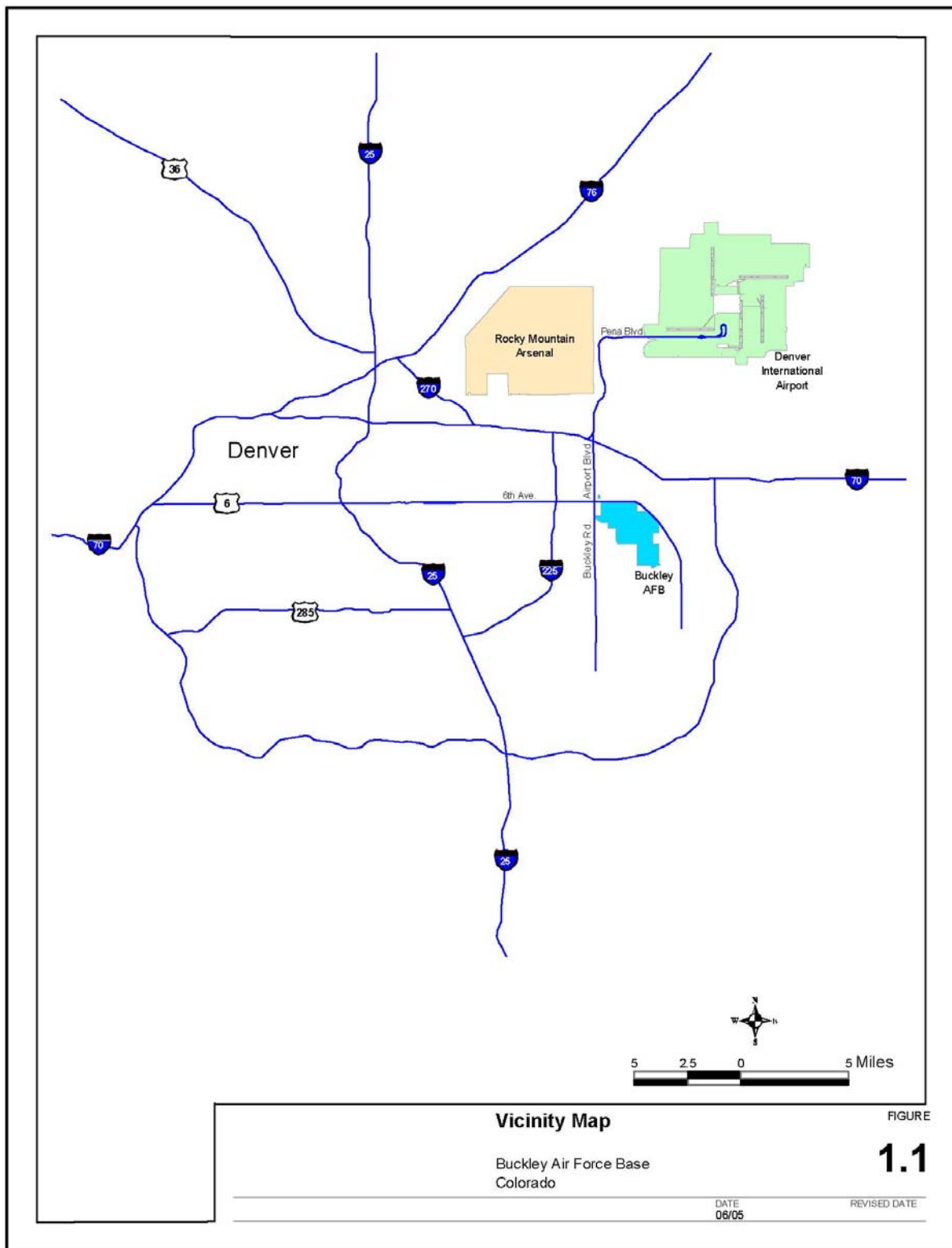
consolidate and co-locate facilities with like or compatible land uses. The goal of the ADP concept is to minimize health, safety, and security risks by segregating incompatible facilities and activities, and by placing similar facilities in close proximity to one another. This approach also optimizes organizational efficiencies, minimizes travel distances and times, and reduces associated potential exposure to hazards.

The remaining CIP projects would occur within seven Existing Land Use Areas (ELUAs) involving approximately 245 acres, including open space; aircraft operations and maintenance; airfield/aircraft pavement; mission operations and maintenance; industrial; 6<sup>th</sup> avenue; and special categories. Congruent with the realignment of Buckley Air National Guard Base (BANGB) to Buckley AFB, the purpose of the Proposed Action is to allow the 460th SW to fulfill its mission as the host at Buckley AFB and provide improvements to the quality of life for on-site, off-site, and retired personnel.

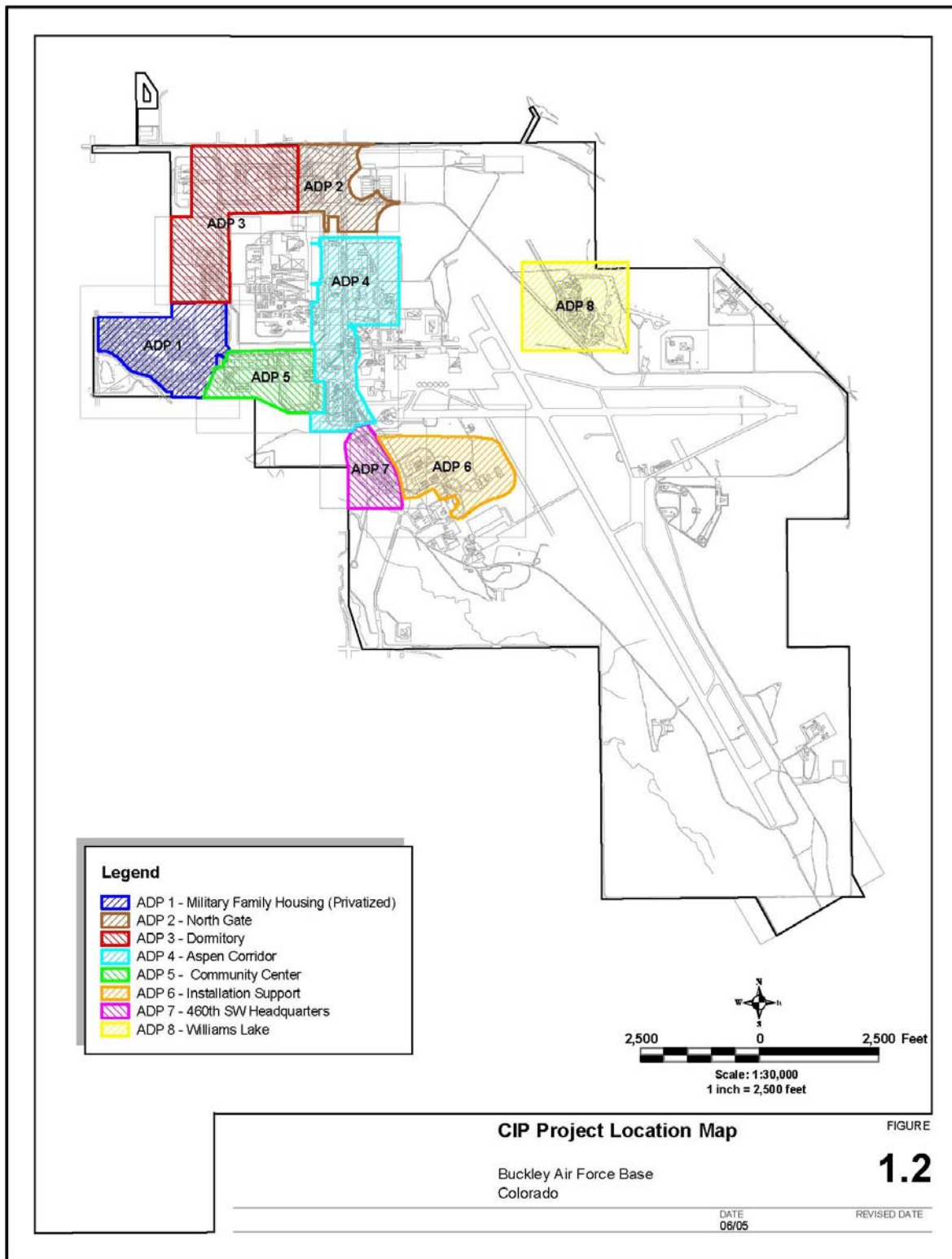
This EA provides Buckley AFB with the information required to understand the potential environmental consequences of the installation build-out and support a Finding of No Significant Impact (FONSI) or a decision to prepare an Environmental Impact Statement. This CIP EA presents a detailed analysis of direct and cumulative impacts associated with the build-out of Buckley AFB. Accordingly, this EA facilitates recognition and remediation of all broad-scale impacts resulting from the build-out process. The cumulative impact analysis presented herein is intended to reduce the need for intensive cumulative impact analysis within subsequent site-specific EAs and assure that cumulative impacts that arise from build-out of the installation are accurately portrayed for review by decision-makers and the public.

## **1.2 LOCATION AND DESCRIPTION OF BUCKLEY AFB**

Buckley AFB is located on the northeast side of the City of Aurora in Arapahoe County, Colorado (Figure 1.1). The Proposed Action includes a total of approximately 823 acres, with approximately 640 acres of total land disturbance, within the 3,283-acre base. Figure 1.2 shows the location of the proposed ADP projects within the base boundaries.



Purpose and Need for the Proposed Action



As mentioned previously, the 460th SW is the host for Buckley AFB. The mission of the 460th SW is to provide combatant commanders with superior global surveillance, worldwide missile warning, expeditionary forces and support to homeland defense. The Military Active Duty population of Buckley AFB is 3,600 (this number does not include Buckley Annex personnel). However, the total installation population, including active duty, civilian, guard/reserve, and contractors, is 12,844 (Buckley AFB 2005a – Source 460 SW/CCX, 4 August 2005).

Buckley AFB is host to diverse missions, military services, and components. These include active-duty, National Guard and Reserve personnel from the USAF, Army, Navy, and Marine Corps to accomplish satellite support operations, fighter operations, installation support, and other important missions.

### **1.3 SCOPE OF THE ENVIRONMENTAL REVIEW**

This EA encompasses the construction and demolition projects scheduled through FY10. The area considered within this EA totals approximately 823 acres within the boundaries of Buckley AFB. Individual ADP, ADP boundaries, and total area are provided in Table 1.1a. The ADPs are distributed throughout the northern two-thirds of the base. In addition, several of the ADPs abut the installation boundary and border directly on private or non-federal properties. Individual construction and demolition projects within each area are described in Section 2 Description of the Proposed Action and Alternatives. The General Plan, including the capital improvements projects, is dynamic and every effort has been made to include the latest information in this EA and annotations have been made where information was either not available.

<b>Table 1.1a: Area Development Plan Boundaries and Areas</b>		
<b>Area Development Plan</b>	<b>Area Development Plan Boundaries</b>	<b>Total Area Development Plan Size (Acres)<sup>(1)</sup></b>
1. Privatized Housing <sup>(2)</sup>	Northern Boundary - Installation Boundary Eastern Boundary - Telluride Street Southern Boundary - Installation Boundary Western Boundary - Airport Boulevard	71
2. Entry Gates <sup>(3)</sup>	Northern Boundary - 6 <sup>th</sup> Avenue Eastern Boundary - Aspen Street Southern Boundary - Keystone Avenue Western Boundary - Between Copper Mountain and Creed Streets	54
3. Dormitory	<u>North Section:</u> Northern Boundary - 6 <sup>th</sup> Avenue Eastern Boundary - Creede Street Southern Boundary - Steamboat Avenue Western Boundary - Telluride Street <u>South Section:</u> Northern Boundary - New Dormitory Access Road Eastern Boundary - Telluride Street Southern Boundary - Telluride Street Western Boundary - Installation Boundary	70
4. Aspen Corridor	<u>North Section:</u> Northern Boundary - Keystone Avenue Eastern Boundary - Vail Street Southern Boundary - Breckenridge Avenue Western Boundary - Eastern Edge of Aerospace Data Facility Security Fence <u>South Section:</u> Northern Boundary - Breckenridge Avenue Eastern Boundary - East of Aspen Street Southern Boundary - Beaver Creek Street Western Boundary - West of Aspen Street	44
5. Community Center	Northern Boundary - Southern Edge of Aerospace Data Facility Security Fence Eastern Boundary - Aspen Street Southern Boundary - South of A-Basin Avenue Western Boundary - West of Telluride Street	41
6. Industrial Support <sup>(4)</sup>	Northern Boundary - Line between existing Fire Station and Hush House (Buildings 806 and 1001) Eastern Boundary - Western edge of Landing Strip Southern Boundary - Civil Engineering Complex Western Boundary - Aspen Street	61



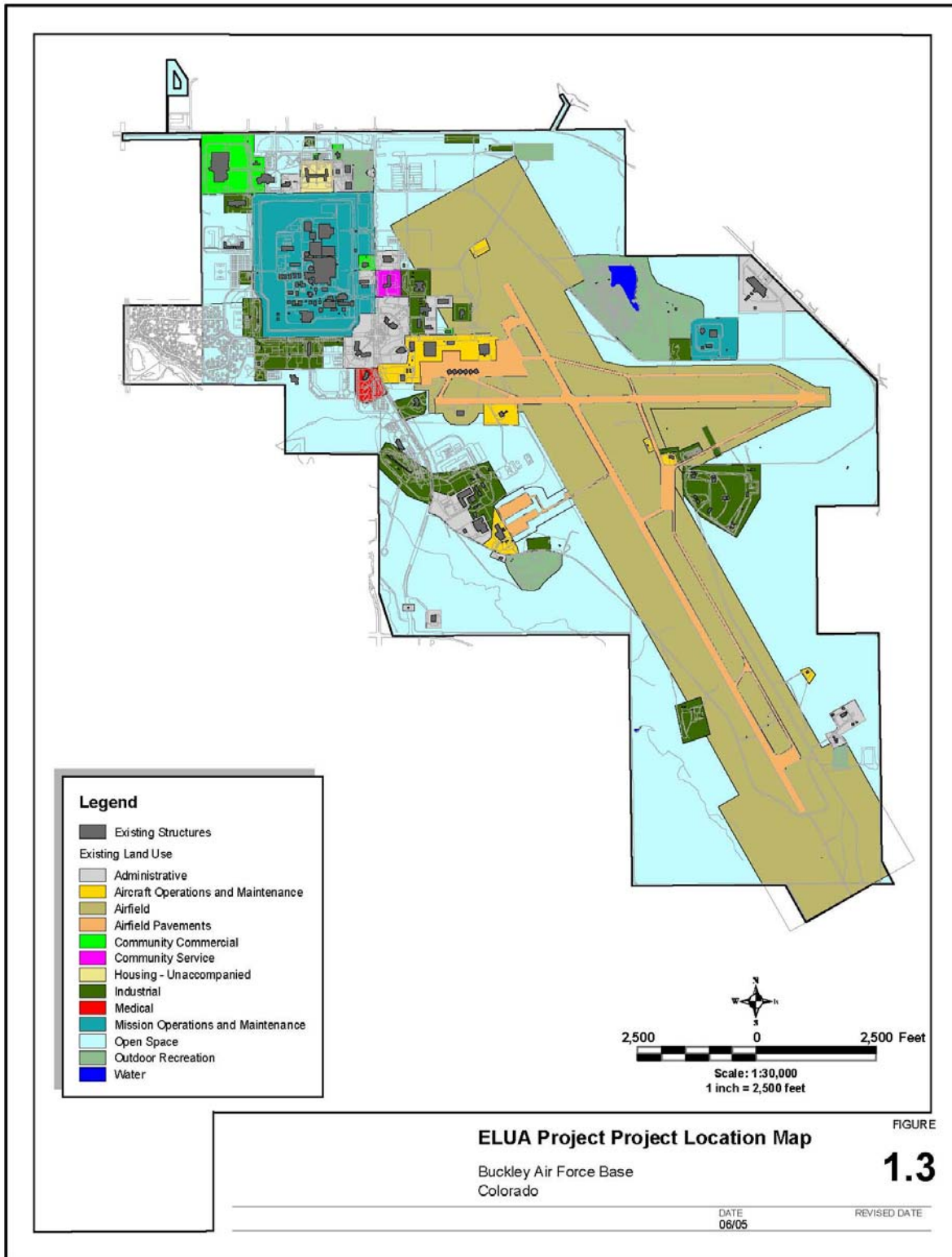
<b>Table 1.1a: Area Development Plan Boundaries and Areas</b>		
<b>Area Development Plan</b>	<b>Area Development Plan Boundaries</b>	<b>Total Area Development Plan Size (Acres)<sup>(1)</sup></b>
7. Headquarters Area <sup>(5)</sup>	Northern Boundary - Beaver Creek Street Eastern Boundary - Aspen Street Southern Boundary - Civil Engineering Complex Western Boundary - Installation Boundary/Open Space	23
8. Williams Lake	Northern Boundary - Pedestrian/Bike Trail Eastern Boundary - Pedestrian/Bike Trail Southern Boundary - Open Space Western Boundary - Steamboat Avenue	32

- (1) Total Area Development Plan Size includes structures, parking lots, sidewalks, landscaping, and open space, where the total development acreage is equivalent to the total land disturbance.
- (2) Formerly Military Family Housing
- (3) Formerly North Gate ADP. The General Plan is currently being updated to include the Mississippi Gate; therefore, the exact boundaries for the unknown at this time and not included in the figures.
- (4) Formerly Installation Support
- (5) Formerly 460<sup>th</sup> SW Headquarters

The seven ELUAs included in the Proposed Action are presented in Table 1.1b and include approximate locations. The ELUAs included in the Proposed Action are also shown on Figure 1.3.

<b>Table 1.1b: Existing Land Use Areas and Approximate Locations</b>	
<b>Existing Land Use Area</b>	<b>Existing Land Use Area Approximate Boundaries</b>
1. Open Space	Acreage distributed throughout the installation.
2. Aircraft Operations and Maintenance	Acreage located in the northwest and west-central portions of the Airfield.
3. Airfield/Aircraft Pavement	Acreage centered on the Buckley AFB Airfield, located in the central portion of the installation.
4. Mission Operations and Maintenance	Acreage located north of Breckenridge Avenue and south of Steamboat Avenue in the northwest portion of the installation.
5. Industrial	Acreage currently located northwest of the airfield and on the eastern side of Aspen Street, extending to the Airfield. Area will be consolidated entirely to the eastern side of Aspen Street.
6. 6 <sup>th</sup> Avenue	Acreage located along the north boundary of the installation and includes the adjacent 6 <sup>th</sup> Avenue roadway
7. Special Categories	Acreage is dispersed in five separate locations throughout the installation.

Purpose and Need for the Proposed Action



Although the majority of impacts are expected to be confined within the boundary of Buckley AFB, certain environmental consequences could extend beyond the base boundaries, particularly those associated with resources susceptible to cumulative impacts (e.g., Biota, see Section 4.3.10.5). Therefore, this EA addresses the Proposed Action's direct, indirect, short-term, long-term, and cumulative impacts, which could extend beyond Buckley AFB boundaries.

The direct impacts of developing each ADP and ELUA are addressed by reference where a NEPA analysis has already been conducted, or presented in an original analysis in Section 3, Affected Environment, of this EA. Cumulative impacts include past, present, and reasonably foreseeable future developments at Buckley AFB, as well as private, commercial, and governmental (city, state, federal) developments that have or may occur in the surrounding areas. The following factors were taken into consideration when assessing the cumulative impacts:

- Intersection of ADPs with surrounding development plans, such as the City of Aurora's Comprehensive Plan (City of Aurora 2003).
- Effects on traffic around the base, such as possible increases in traffic and associated air emissions.
- Consideration of City of Aurora drought management plans and watering restrictions resulting from drought conditions occurring during and prior to 2002.
- Impacts of increased stormwater discharges due to increased impervious areas, as well as mosquito abatement related to retention ponds, if retention ponds are required.
- Consideration of species of concern, including the black-tailed prairie dog (*Cynomys ludovicianus*) (state species of concern), bald eagle (*Haliaeetus leucocephalus*) (state and federal threatened species), ferruginous hawk (*Buteo regalis*) (state species of concern), and the burrowing owl (*Athene cunicularia*) (state threatened species).
- Noxious weed eradication and conservation of shortgrass prairie stands.
- Consideration of general land use and potential off-base black-tailed prairie dog migrations that may result due to excavation and construction activities.

- Effects of potential asbestos in soils from demolition of World War II era building facilities that may be disturbed by excavation and construction.

The cumulative impact concerns listed above are fully analyzed in relation to potentially affected environmental resources in Section 4, Environmental Consequences. The region of influence for each potentially affected environmental resource is delineated in Section 3, Affected Environment.

#### **1.4 ORGANIZATION OF THE EA**

This EA is divided into seven sections. Section 1 of the EA describes the purpose and need for the Proposed Action. Section 2 of the EA describes the Proposed Action and No Action alternatives. Section 3 describes the affected environment and scope of environmental review. Section 4 presents the environmental consequences of the Proposed Action and No Action alternatives, including cumulative impacts. The cumulative impact methodology (including type of environmental issue, degree of potential impact, and best management procedures which may reduce the impact) and their application to resources are also presented in Section 4. Section 5 presents the list of preparers, and Section 6 presents a list of agencies, organizations, and persons to whom the EA was sent. Section 7 provides references.

#### **1.5 APPLICABLE REGULATORY REQUIREMENTS**

NEPA requires decision-makers to understand major permitting requirements of the Proposed Action so that early planning is carried out effectively and potentially impeding issues, as well as other state and federal requirements, are clearly understood. All applicable regulatory requirements related to the Proposed Action discussed in this EA will be followed. A brief description of the regulatory requirements is provided below.

**Endangered Species Act (ESA) – Section 7.** If the Proposed Action would impact any species listed under the Endangered Species Act, the United States (U.S.) Fish and Wildlife Service (USFWS) must be contacted, consulted and suitable actions determined and taken to minimize or eliminate potential impacts.

**Migratory Bird Treaty Act (MBTA).** The MBTA requires permits to be obtained to take migratory birds.

**National Historic Preservation Act – Section 106 (NHPA).** While impacts are not anticipated, the installation would conduct Section 106 consultation per the NHPA if any action would impact the buildings that are eligible for listing on the National Register of Historic Places.

**Spill Prevention, Control, and Countermeasure (SPCC) Plan.** New tank systems used to store and supply fuels to boilers and/or emergency backup generators resulting from implementation of the Proposed Action would require revisions to the Buckley AFB SPCC Plan, in accordance with 40 CFR 112.5.

**Stormwater Permit Requirements.** A stormwater Construction General Permit (CGP) issued under the United States Environmental Protection Agency's (USEPA) National Pollutant Discharge Elimination System (NPDES) would be required for CIP projects on sites greater than one acre. The CGP Permit and construction activities would be reviewed by the Buckley AFB per their Municipal Separate Storm Sewer Systems (MS4) permit.

**Tank Registration.** Tanks with a capacity between 660 and 40,000 gallons that would be installed as part of CIP projects would need to be registered with the State of Colorado Department of Labor and Employment (CDLE) Division of Oil and Public Safety.

**Clean Air Act Requirements.**

- Site-grading and construction/demolition activities for some projects included in the Proposed Action would be expected to require a Land Development Air Pollution Emission Notice (APEN) from the Colorado Department of Public Health and the Environment (CDPHE) because the size of individual project land disturbance would exceed the 25-acre threshold. Individual projects that are likely to require a Land Development APEN include the Privatized Housing; Taxiway Arm/Disarm; and Runway and Taxiway Ramp Repairs projects. Land Development APEN would also be required for any project that would exceed the six-month ground disturbance time threshold.
- Steam generating boilers and/or backup generators and associated fuel tanks, hot water heaters, and chillers that would be installed and operated are required to be on the Base emissions inventory.

- Chillers that are 100 horsepower or greater must be registered with the state within 30 days of installation.

## **SECTION 2**

### **DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES**

This section describes the proposed CIP projects located within eight ADP districts at Buckley AFB. As part of the facility development portion of the CIP, there are approximately 110 construction and demolition CIP projects. The majority of the projects would be concentrated within eight proposed ADPs involving approximately 640 acres of land located predominantly in the northwest half of the installation. The remaining construction and demolition projects are proposed for seven ELUAs.

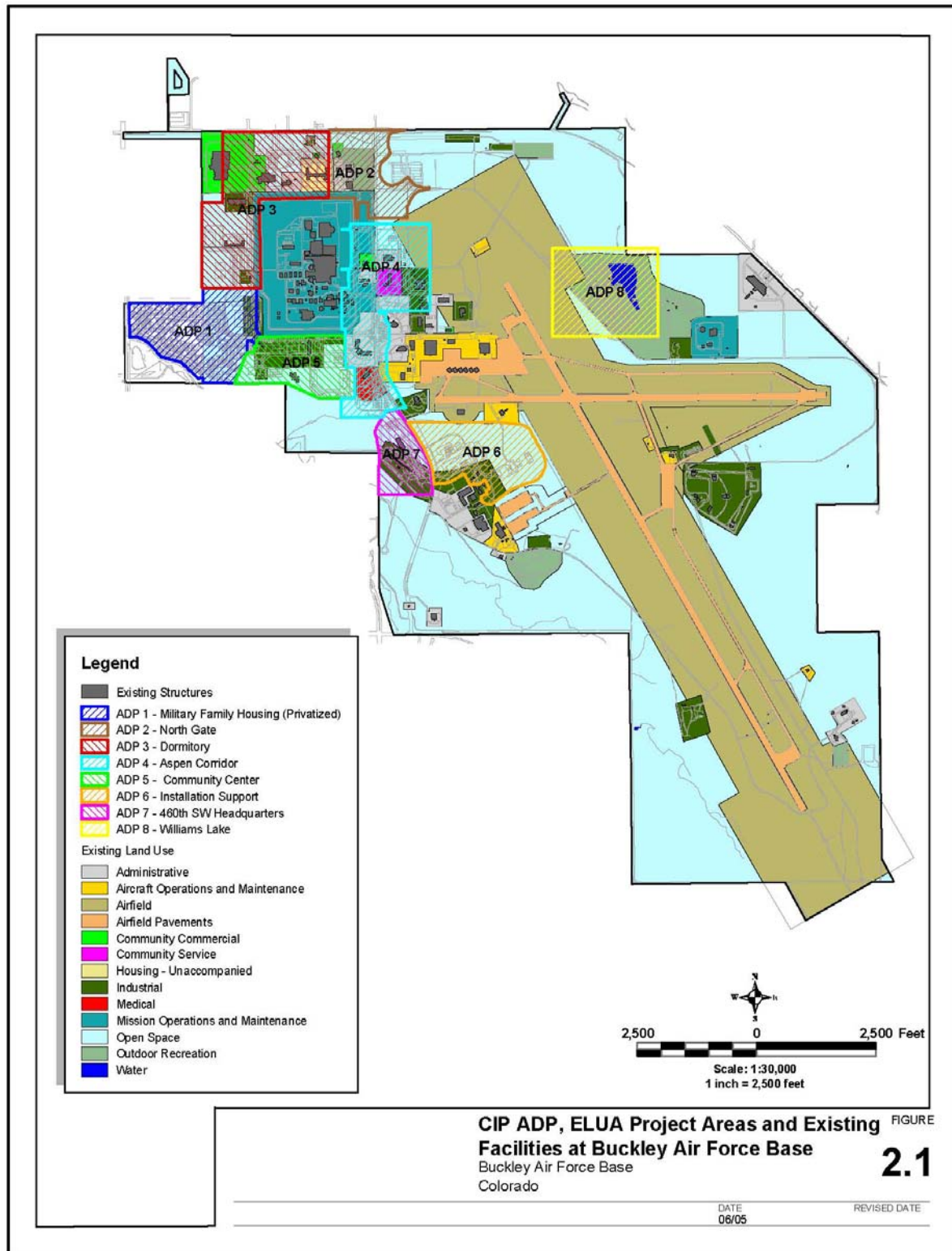
Three alternatives are analyzed in this EA: (1) the Proposed Action for each construction and/or demolition project (completion of the CIP projects), as described below in Section 2.1; (2) the Alternative Action 1 (accelerated build-out of specific projects of the Proposed Action), as described below in Section 2.2.2; and (3) the No Action Alternative, as described in Section 2.2.3, below. Alternatives considered but eliminated from further analysis are described in Section 2.2.1.

#### **2.1 PROPOSED ACTION**

The CIP is a construction and demolition program that primarily focuses on eight ADPs concentrated in the northern two-thirds of the installation, and the Williams Lake area, located in the northeastern quadrant of the installation (Buckley AFB 2002a). ADPs are urban design areas used to foster USAF installation development. Individual ADPs show future site planning, building design and siting, vehicular and pedestrian circulation, parking, and landscaping. The eight ADPs were prepared using the principles set forth in the USAF Area Development Planning Bulletin (USAF 1991). The original General Plan (Buckley AFB, 2002a) figures for the ADP's are located in Appendix A and appear "as is" with no updates, revisions, or changes.

Projects ranging from construction of new athletic fields to erecting the new headquarters building are located within the eight ADPs and seven ELUAs. Tables 2.1a and 2.1b lists the eight ADPs and seven ELUAs and associated component construction and demolition projects (Buckley AFB 2005). Figure 2.1 depicts the location of the ADPs and ELUAs in relation to each other and existing facilities at Buckley AFB.

Description of the Proposed Action and Alternatives





<b>TABLE 2.1a: Area Development Plan Projects<sup>(1)</sup></b>			
<b>Area Development Plan</b>	<b>Proposed Construction Year</b>	<b>CIP Projects</b>	<b>Development Footprint<sup>(2)</sup> (Acres)</b>
1. Privatized Housing ADP <sup>(7)</sup>	FY05 FY05 FY05 FY09 TBD	<ul style="list-style-type: none"> <li>• 351 Housing Units</li> <li>• Clubhouse/Pool</li> <li>• Playgrounds/Tot Lots</li> <li>• Demolition of Building 200 (Jet Fuel Tanks/Refueling Operations Building)<sup>(3)</sup></li> <li>• Youth Athletic Fields</li> </ul>	71
2. Entry Gates ADP <sup>(8)</sup>	FY09 FY11 FY04 FY05  FY06 FY06 FY04 FY04  FY05 FY03  FY11 FY02 FY09 FY09 TBD	<ul style="list-style-type: none"> <li>• Entry Control Gate – Main/6<sup>th</sup> Avenue</li> <li>• Visitors Center</li> <li>• Visitors Center Parking lot</li> <li>• Athletic Fields (Baseball Fields, Running Track/Football/Soccer Field)</li> <li>• Space Operations Parking</li> <li>• 6<sup>th</sup> Avenue Deceleration Lanes</li> <li>• Aspen Street Improvements</li> <li>• Remove three Temporary Modular Buildings [T-10 (Mod 1), T-11 (Mod 3), T-12 (Mod 2)]<sup>(4)</sup></li> <li>• Demolish Building 19 (Camana Club)</li> <li>• Demolish Building 25 (Reserve Component Medical Training Building)<sup>(4)</sup></li> <li>• Demolish Building 41 (Existing Visitors Center)</li> <li>• Demolish Existing Ball fields</li> <li>• Entry Control Gate – Mississippi Gate</li> <li>• Entry Control Gate – Telluride Gate</li> <li>• Community Activity Center</li> </ul>	54
3. Dormitory ADP <sup>(5)</sup>	FY02 FY04 TBD FY06 FY06 FY02 FY02 FY02 FY06 FY05 FY06 FY10 FY04	<ul style="list-style-type: none"> <li>• Fitness Center</li> <li>• Dormitory #2</li> <li>• Dormitory #3</li> <li>• Car Wash</li> <li>• Pharmacy</li> <li>• Telluride Gate</li> <li>• New Gas Meter House</li> <li>• Space Operations Parking</li> <li>• Winterpark Avenue</li> <li>• Athletic Fields and Courts</li> <li>• Athletic Field Concession</li> <li>• Fitness Center Swimming Pool Addition</li> <li>• Demolition of Building 39 (Gas Meter House)</li> </ul>	70

**TABLE 2.1a: Area Development Plan Projects<sup>(1)</sup>**

Area Development Plan	Proposed Construction Year	CIP Projects	Development Footprint <sup>(2)</sup> (Acres)
	TBD <sup>(5)</sup>	<ul style="list-style-type: none"> <li>Demolition of Building 210 (Security Forces Kennel)</li> </ul>	
	FY02	<ul style="list-style-type: none"> <li>Demolition of Winter Park Avenue Parking Lot and Street West of Dormitory #1</li> </ul>	
	FY04	<ul style="list-style-type: none"> <li>Demolition of Street and Parking Lot in the Vicinity of Building 28 and Portions of Beaver Creek Street</li> </ul>	
4. Aspen Corridor ADP	FY04 FY06 FY05 FY06 FY04 FY04 FY03 FY05	<ul style="list-style-type: none"> <li>Aspen Street Improvement Landscaping</li> <li>Communications Addition (Building 730)</li> <li>Clinic Addition (Building 600)</li> <li>Clinic Warehouse</li> <li>Fire Station Addition (Building 806)</li> <li>New Dedicated Fire Water Main and Laterals</li> <li>Child Development Center (CDC) Addition (Building 725)</li> <li>Demolition of Roads and Parking Lot Adjacent Building 600 (Clinic Parking Area)</li> </ul>	44
5. Community Center ADP	FY05 FY05 FY05 FY06 TBD <sup>(5)</sup> FY08 FY06 FY07 FY09 FY09 TBD TBD FY09 FY09	<ul style="list-style-type: none"> <li>Central Mall (Landscaping, sidewalks etc. for ADP 5)</li> <li>Chapel</li> <li>CDC</li> <li>Consolidated Services Facility</li> <li>Skills Development Center Remodel (Building 340)</li> <li>Education Center</li> <li>Youth Center</li> <li>Visitor's Quarters/Temporary Lodging Facility</li> <li>Demolition of Buildings 300 and 302 (Petroleum Operations Buildings)<sup>(3)</sup></li> <li>Demolition of Building 341 (Vehicle Fuel Station)<sup>(3)</sup></li> <li>Demolition of Building 310 (H-70 (Hydrazine) Fuel Storage Building)</li> <li>Demolition of Building 306 (Entomology Shop Building)</li> <li>Demolition of Building 344 (Hazardous Storage)</li> <li>Demolition of Portable Building (PB) 605 (Gas Mask Training Building)</li> </ul>	41
6. Industrial Support ADP <sup>(9)</sup>	FY04 FY07 FY08 FY06 TBD FY09 FY03	<ul style="list-style-type: none"> <li>Transportation System/Aspen Ave</li> <li>Logistics Complex</li> <li>Vehicle Maintenance</li> <li>Outdoor Recreation Supply</li> <li>Auto Skills Center</li> <li>Consolidated Base Warehouse</li> <li>Entomology Shop</li> </ul>	61

<b>TABLE 2.1a: Area Development Plan Projects<sup>(1)</sup></b>			
<b>Area Development Plan</b>	<b>Proposed Construction Year</b>	<b>CIP Projects</b>	<b>Development Footprint<sup>(2)</sup> (Acres)</b>
	FY06 FY06 FY07  FY03 FY04	<ul style="list-style-type: none"> <li>• Hazardous Materials (HAZMAT) Pharmacy</li> <li>• Hazardous Waste Building</li> <li>• Consolidated Fuels Storage (Petroleum, Oil and Lubricant [POL] Operations Building and POL Bulk Operations Building Storage)</li> <li>• Civil Engineering Warehouse</li> <li>• Fire Station Addition (Building 806)</li> </ul>	
7. Headquarters Area ADP <sup>(10)</sup>	FY03 FY03 FY06 FY04 FY05  FY06	<ul style="list-style-type: none"> <li>• 460 SW Headquarters</li> <li>• Golf Driving Range</li> <li>• Leadership Development Center</li> <li>• Transportation System/Aspen Ave</li> <li>• Demolition of Building 1011 (Base Civil Engineer (BCE) Storage Area)</li> <li>• Demolition of Building 1012 (Sanitary Latrine)</li> </ul>	23
8. Williams Lake ADP	TBD <sup>(5)</sup> TBD <sup>(5)</sup> TBD <sup>(5)</sup> TBD <sup>(5)</sup> TBD <sup>(5)</sup> FY 04 FY10 <sup>(5)</sup>  TBD <sup>(5)</sup>	<ul style="list-style-type: none"> <li>• Realign Steamboat Avenue</li> <li>• Relocate Jogging Trail</li> <li>• Core Area, Picnic shelters and sites</li> <li>• Recreational Vehicle (RV) Parking</li> <li>• Playground</li> <li>• Two Pavilions</li> <li>• Family Camp (FAM Camp), including Rest Room/Shower</li> <li>• Tent Camping Area</li> </ul>	32

(1) Source: Buckley AFB, 2002a, b, and 2005a.

(2) Development Footprint includes structures/parking lots/sidewalks, landscaping, and construction preparation and laydown areas. See Table 1.1a for total ADP acreage.

(3) Demolition of the Jet Fuel Tanks/Refueling Area is part of the consolidated fuels construction project

(4) Mod 3 building was removed in 2004, Mod 1 is scheduled for removal in 2005, and building 25 was demolished in 2003.

(5) Source: Buckley AFB, 2002a, ADP is tied to the construction of the Security Forces building

(6) TBD = To Be Determined for projects scheduled beyond 2010 (year of completion currently unknown/unspecified).

(7) Formerly Military Family Housing.

(8) Formerly North Gate ADP. The General Plan is currently being updated to include the Mississippi Gate; therefore, the exact boundaries for the unknown at this time and not included in the figures.

(9) Formerly Installation Support.

(10) Formerly 460<sup>th</sup> SW Headquarters.

**Table 2.1b: Existing Land Use Area Projects**

Existing Land Use Area	Proposed Construction Year	Facility Development Projects	Development Footprint* (Acres)
1. Open Space ELUA	TBD FY04  FY08 FY06 FY06 FY06 FY05	<ul style="list-style-type: none"> <li>• New Munitions and Hazardous Materials Gate</li> <li>• Live Fire Training Facility Base (Prefabricated facility to be installed in FY09)</li> <li>• Outdoor Small Arms Range</li> <li>• Demolish Radio Relay (Building 1620)</li> <li>• Demolish Reserve Forces (Building 1632)</li> <li>• Demolish Electrical Shop (Building 1631)</li> <li>• Demolish Marine Area Foundations</li> <li>• Vail Street Improvements</li> </ul>	8
2. Aircraft Operations and Maintenance ELUA	FY03 FY03 FY03 FY04 FY05 FY09 FY06 FY07	<ul style="list-style-type: none"> <li>• Control Tower</li> <li>• Engine Shop Addition (Building 700)</li> <li>• Runway and Taxiway Ramp Repairs</li> <li>• H-70 (Hydrazine) Fuel Storage</li> <li>• Army Aviation Support Facility</li> <li>• Weapons Release Complex Expansion</li> <li>• Freight Transfer Facility</li> <li>• Replace Squadron Operations Facility</li> </ul>	23
3. Airfield/ Aircraft Pavement ELUA	FY03 FY04 FY05 FY07 FY09 FY10	<ul style="list-style-type: none"> <li>• Runway and Taxiway, Ramp Repairs</li> <li>• Addition/Alteration (ADAL) Access Roads</li> <li>• Taxiways A&amp;K Repairs</li> <li>• Permanent Alert Shelters and Crew Quarters</li> <li>• West Taxiway and Arm/Disarm Pads</li> <li>• High-speed Taxiway</li> </ul>	150
4. Mission Operations and Maintenance ELUA	FY03  FY08  FY08 FY09  FY10 FY12	<ul style="list-style-type: none"> <li>• ADAL Space-Based Infrared System (SBIRS) Mission Control; Space Operations Area</li> <li>• Two Temporary Aerospace Data Facility (ADF) Denver Security Operations Center (DSOC) Modular Facilities</li> <li>• Permanent DSOCADF Facility</li> <li>• Space Based Infrared (SBIRS) Operations Support Facility (demolish Buildings 429 and 431)</li> <li>• SBIRS Remote Ground Station</li> <li>• Demolish SBIRS Buildings 429 and 431</li> </ul>	43
5. Industrial ELUA	FY05 FY06 FY09  FY08 FY06 FY06	<ul style="list-style-type: none"> <li>• Air National Guard Civil Engineer Complex</li> <li>• Demolish Old Base Exchange (Building 902)</li> <li>• Demolish Traffic Management Facility (Building 940)</li> <li>• Demolish Communications Facility (Building 950)</li> <li>• Demolition Pump Station (Building 1103)</li> <li>• Demolition Control Tower (Building 1606)</li> </ul>	3

<b>Table 2.1b: Existing Land Use Area Projects</b>			
6. 6 <sup>th</sup> Avenue ELUA	FY20	<ul style="list-style-type: none"> <li>Widen 6<sup>th</sup> Avenue From Airport Boulevard to 6<sup>th</sup> Avenue Gate</li> </ul>	16
7. Special Categories ELUA	FY10 FY10 FY10	<ul style="list-style-type: none"> <li>Demolish Small Arms Range (Building 1415)</li> <li>Demolish Range Supply and Equipment Storage (Building 1411)</li> <li>Demolish Range Target Storage and Repair (Building 1413)</li> </ul>	0

\* Development Footprint includes structures/parking lots/sidewalks, landscaping, and construction preparation and laydown areas.

Planned demolition projects are also presented in Section 2.1.11 and range from a small arms range to the existing Visitors Center. Demolition procedures are discussed in Section 2.1.11.1, Demolition.

The locations of proposed ADP projects are shown on Figures 2.2 through 2.9, however these figures represent conceptual designs and final individual design and facility sitings are subject to change within the ADP. The planning areas consolidate and collocate facilities with like or compatible land uses and minimize health, safety, and security risks by segregating incompatible facilities and activities, and by placing similar facilities in close proximity to one another. For instance, it is inadvisable to locate social activity centers, such as churches, community centers, and schools, near fuel storage and loading facilities. Consequently, an existing Jet Fuel Storage Tank and Refueling Operation area within ADP 2 would be relocated.

Selection and location of the facilities within each ADP was based on the existing location of similar facilities. Consequently, most of the ADPs take their basic character from concentrations of existing facilities, while a few, such as the Privatized Housing ADP, are wholly new developments located largely on undeveloped land within Buckley AFB. Open Space added as part of the ADPs emphasize maintaining or expanding greenbelt buffers and environmental conservation corridors and creating linkages to pedestrian walkways in close proximity to all major work areas.

Construction of new roadways necessary to support efficient movement in and around existing facilities and the planned construction would add 10 miles of two-lane roadway to the installation infrastructure (Buckley AFB 2002a). In addition, approximately 5,000 parking

spaces would be constructed at various locations shown in the ADP drawings (Figures 2.2 through 2.9). Specific roadway projects include the extension of Telluride Street to provide access to the Privatized Housing ADP, upgrading of A-Basin Avenue to support the Community Center ADP, and realignment of Aspen Street and Steamboat Avenue to remove them from the Primary Surface and Clear Zone, respectively (Buckley AFB 2002a). Each of the ADPs is described below.

### **2.1.1 ADP 1: Privatized Housing**

Although Buckley AFB has historically been a commuter installation with a small resident population, future plans include construction of 351 MFH units on the base as part of this ADP. Two additional units will also be constructed and are planned for occupancy by the Property Manger and the Property Maintenance Supervisor. Since the GP's initial printing in 2002, this ADP has been carried forward and is now under construction to include the accompanied housing units and other amenities. New and future USAF missions require a larger resident population necessitating provision of on-site privatized housing. Objectives of the Privatized Housing ADP are:

- Develop housing and neighborhoods comparable to the private sector
- Provide required force protection
- Encourage a sense of community
- Encourage pedestrian/bicycle transportation/circulation
- Take advantage of mountain views
- Be convenient to services located elsewhere on the installation
- Provide a child-friendly environment
- Site and design buildings that are responsive to the climate
- Design Landscaping that provides irrigated, improved areas balanced with non-irrigated, less improved areas
- Economic feasibility (Buckley AFB 2005a).

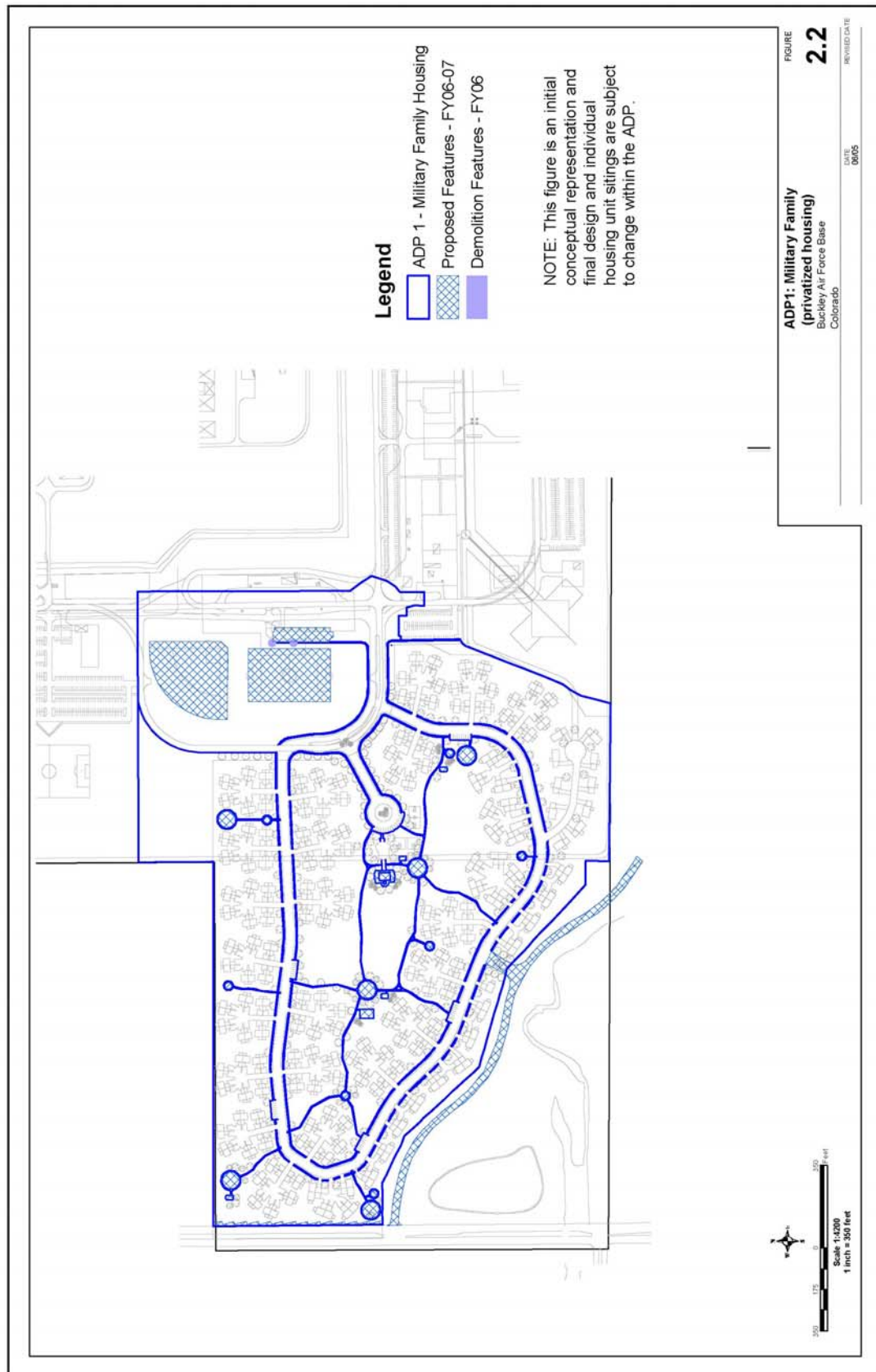
The Privatized Housing ADP is proposed to be a 351 unit, 71-acre development (within the 71-acre ADP) located on the west-central boundary of the installation (Buckley AFB 2002c). The proposed locations of housing units are shown on Figure 2.2. However, the figure is an initial conceptual representation and final design and individual housing unit sitings are subject to change within the ADP. The Privatized Housing ADP is planned as a high-quality residential area to serve installation residents. Housing would be sited so that separate areas exist for key and essential personnel, company grade officers, field grade officers, senior non-commissioned officers (NCOs), and junior NCOs. Infrastructure utilities would be supplied by off-base system tie-ins. This ADP would be developed on land that is currently undeveloped and would include a variety of site amenities such as group mailboxes, trash enclosures, playgrounds, tot lots, a clubhouse and pool, walking paths, soccer field, basketball courts, and open space (Buckley AFB 2002a, c). The adjacent viewshed to the south includes the East Toll Gate Creek open space and a proposed City of Aurora park. Trails would connect this ADP to an installation-wide trail system to encourage pedestrian travel. Demolition would include Building 200 (Jet Fuel Tanks/Refueling Operations Building). Table 2.2 lists components planned for inclusion in the Privatized Housing ADP. Construction of new facilities would result in an additional 734,798 ft<sup>2</sup> of building space and 53 parking lot spaces.

The environmental consequences of constructing the Privatized Housing ADP were previously described in the “Environmental Assessment for Housing Privatization at Buckley AFB, Colorado” (Buckley AFB 2002c). That EA is incorporated in this EA by reference, and therefore, development of the Privatized Housing ADP does not require further environmental consequences analysis. However, the CIP EA addresses the cumulative impacts, to include the construction and operation of the Privatized Housing ADP in Section 4, Environmental Consequences, because cumulative impacts for CIP construction projects are an integral part of this EA.

Table 2.2: ADP 1 - Privatized Housing	
Area Development Plan	Component Projects
Privatized Housing	<ul style="list-style-type: none"> <li>• 351 Housing Units</li> <li>• Clubhouse/Pool</li> <li>• Playgrounds/Tot Lots</li> <li>• Demolitions Jet Fuel Tanks/Refueling Area (Building 200)*</li> <li>• Youth Athletic Fields</li> </ul>

\* Demolition of Jet Fuel Tanks/Refueling Area is part of the consolidated fuels construction project.





### **2.1.2 ADP 2: Entry Gates<sup>1</sup>**

The Entry Gates ADP is a high visibility location containing the primary access point for Buckley AFB from 6<sup>th</sup> Avenue and Mississippi Avenue. Much of the ingress/egress from the installation occurs at the Main Gate, and visitors' first impressions occur in proximity to the Main Gate. Development of this ADP would occur on 54 of the 60 acres. This ADP was prepared in response to a requirement to enhance the appearance and functionality of the Main Gate at Buckley AFB. This ADP also encompasses the redesign of the Mississippi Gate. Objectives for this ADP are:

- Relocate and expand the Visitors Center to relieve congestion and improve force protection.
- Redesignate the Mississippi Gate as the primary truck entrance and redesign the gate accordingly.
- Provide additional athletic facilities to support a growing population.
- Provide additional parking for space operations personnel.
- Improve first impressions of Buckley AFB.
- Promote pedestrian circulation (Buckley AFB 2005a).

A central feature of this ADP is the relocation of the Visitors Center to accommodate increased visitation while maintaining traffic flow. The Visitors Center would be relocated between 6<sup>th</sup> Avenue and the existing gate so that traffic volume around the Main Gate is diminished. Table 2.3 lists construction projects planned for the Entry Gates ADP. Construction of new facilities would result in approximately 22,181 ft<sup>2</sup> of new construction and 1,414 parking lot spaces. There would be a net decrease of building square footage by approximately 61,575 square feet due to the proposed demolition projects. New facility locations are shown in Figure 2.3, although final individual facility sitings are subject to change within the ADP. The proposed new Athletic Fields in particular, may be subject to relocation. The proposed location for the

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<sup>1</sup> This portion of the original General Plan has expanded to include all Gates, where the web-based General Plan is still under development with regards to the figures. The Gates projects will be assessed in a separate EA that will include updated figures.

Athletic Fields would be on an approximately 20 acre rectangular plot located along the northern installation boundary between Aspen Street and Telluride Street on the east and west, and directly north of Winterpark Avenue. This facility may be located on a 16 acre rectangular plot located west of the intersection of Telluride Street and Devils Thumb Avenue, near the western boundary of the base, within the Dormitory ADP. Infrastructure and utilities are available within the Entry Gates ADP. New facilities include a parking lot, walkways and paths for the Visitors Center, and new parking for the Space Operations, Community Activity Center, and new entry control gates. Existing facilities include the two baseball fields, the Main Gate and Visitors Center, the Camana Club, three temporary modular buildings, and Mississippi Gate Guard House. Demolitions would include Building 19 (the Camana Club), Building 25 (Reserve Component Medical Training Building), Building 41 (Visitors Center), Building 1552 (Mississippi Gate Guard House) and demolition of the existing ball fields. The three existing modular temporary buildings would be removed. Building 25 has been demolished and one of the modular units has been removed.

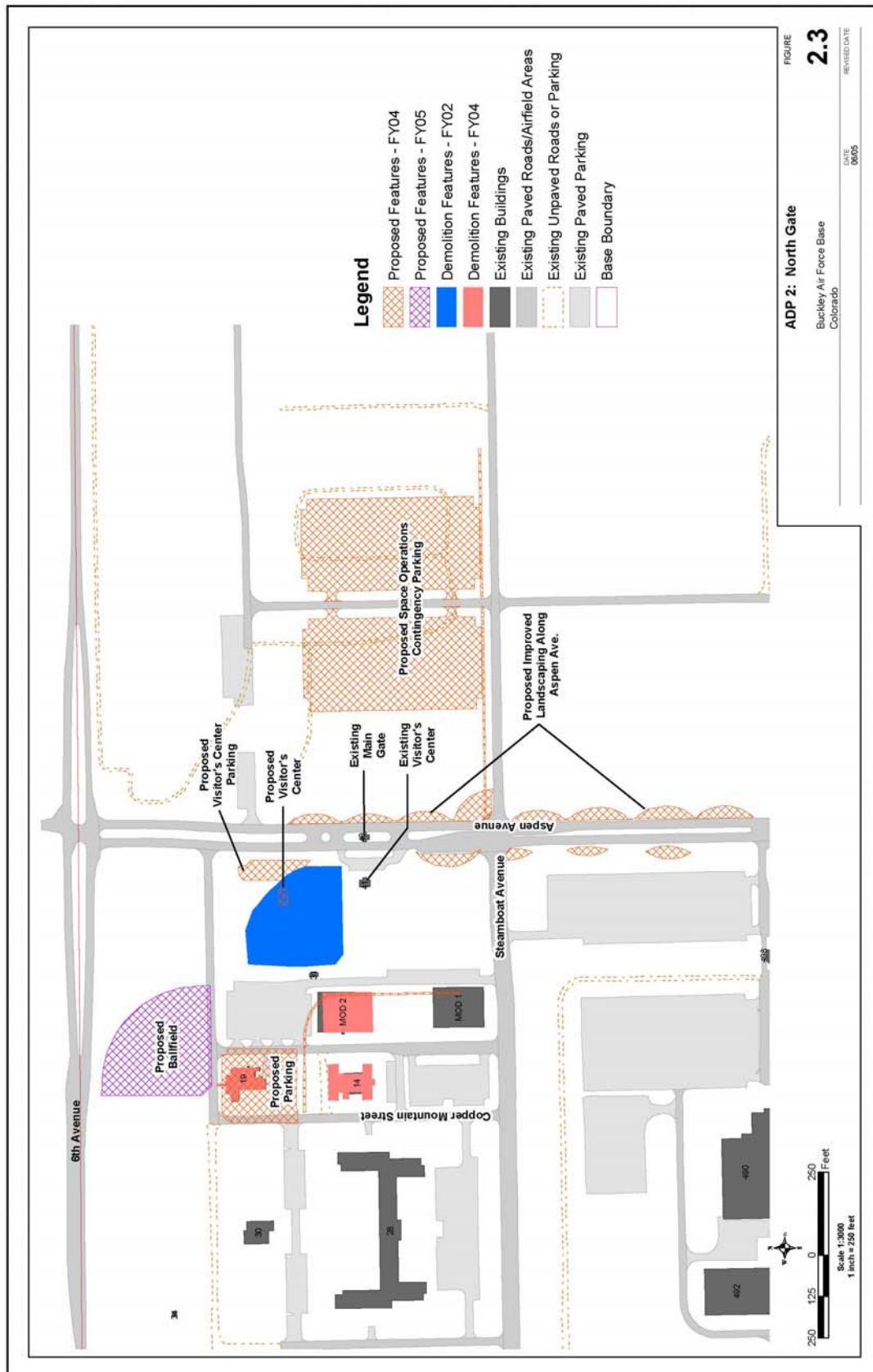
**Table 2.3: ADP 2 - Entry Gates**

Area Development Plan	Component Projects
Entry Gates <sup>(1)</sup>	<ul style="list-style-type: none"> <li>• Entry Control Gate – Main/6<sup>th</sup> Avenue</li> <li>• Visitors Center</li> <li>• Visitors Center Parking lot</li> <li>• Athletic Fields (Baseball Fields, Running Track/Football/Soccer Field)</li> <li>• Space Operations Parking</li> <li>• 6<sup>th</sup> Avenue Deceleration Lanes</li> <li>• Aspen Street Improvements</li> <li>• Remove three Temporary Modular Buildings [T-10 (Mod 1), T-11 (Mod 3), T-12 (Mod 2)] <sup>(2)</sup></li> <li>• Demolish Building 19 (Camana Club)</li> <li>• Demolish Building 25 (Reserve Component Medical Training Building) <sup>(2)</sup></li> <li>• Demolish Building 41 (Existing Visitors Center)</li> <li>• Demolish Existing Ballfield</li> <li>• Entry Control Gate – Mississippi Gate</li> <li>• Demolish Building 1552 (Mississippi Gate Guard House)</li> <li>• Entry Control Gate – Telluride Gate</li> </ul>

(1) Formerly North Gate ADP. The General Plan is currently being updated to include the Mississippi Gate; therefore, the exact boundaries for the unknown at this time and not included in the figures.

(2) Mod 3 building was removed in 2004, Mod 1 is scheduled for removal in 2005, and building 25 was demolished in 2003.

Description of the Proposed Action and Alternatives



### **2.1.3 ADP 3: Dormitory**

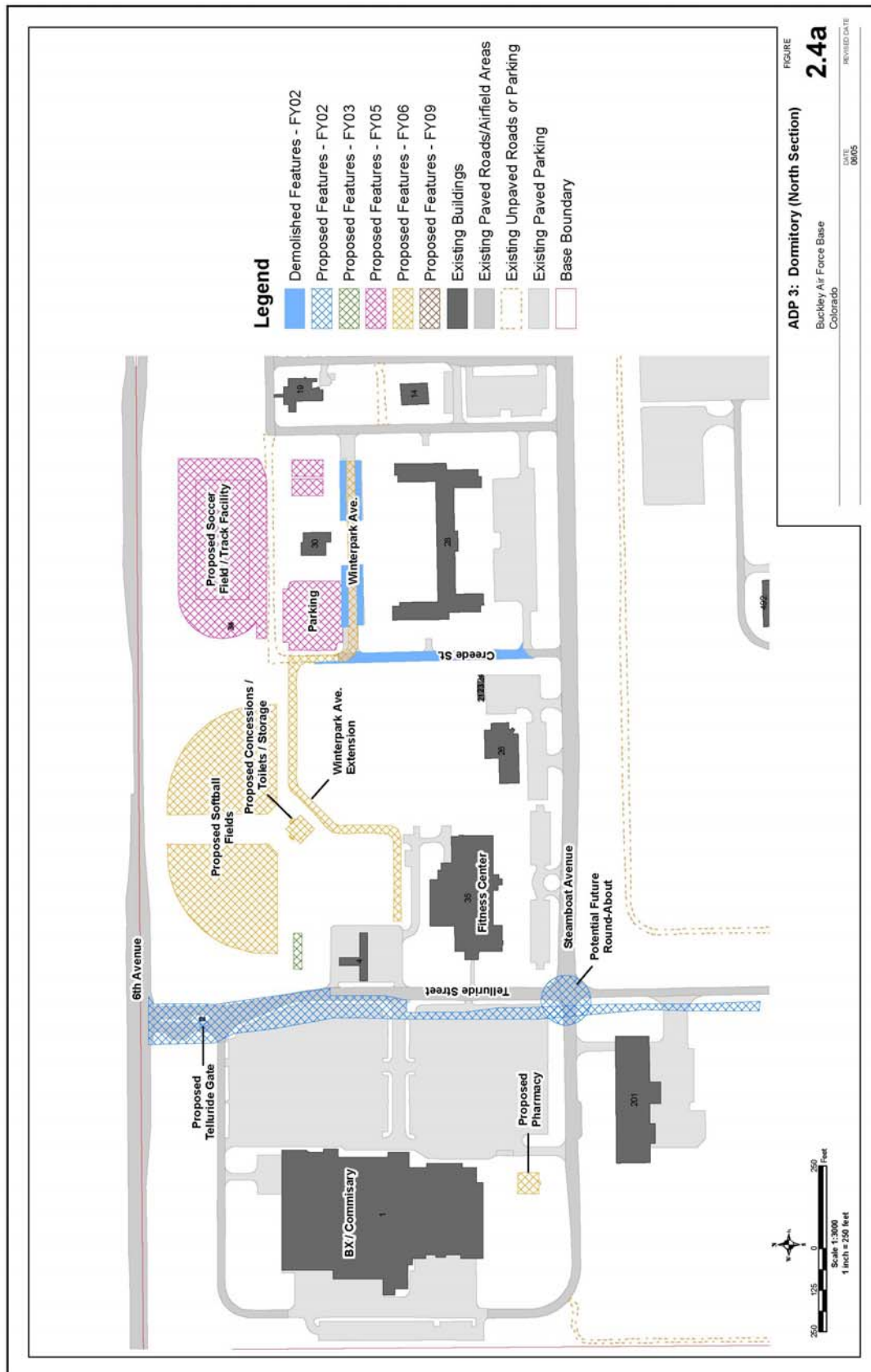
The Dormitory ADP is designed to accommodate unaccompanied personnel residing at Buckley AFB. This 123-acre ADP encompasses the existing and future dormitories, fitness center, and the Base Exchange (BX)/Commissary complex.

The objectives of this ADP are:

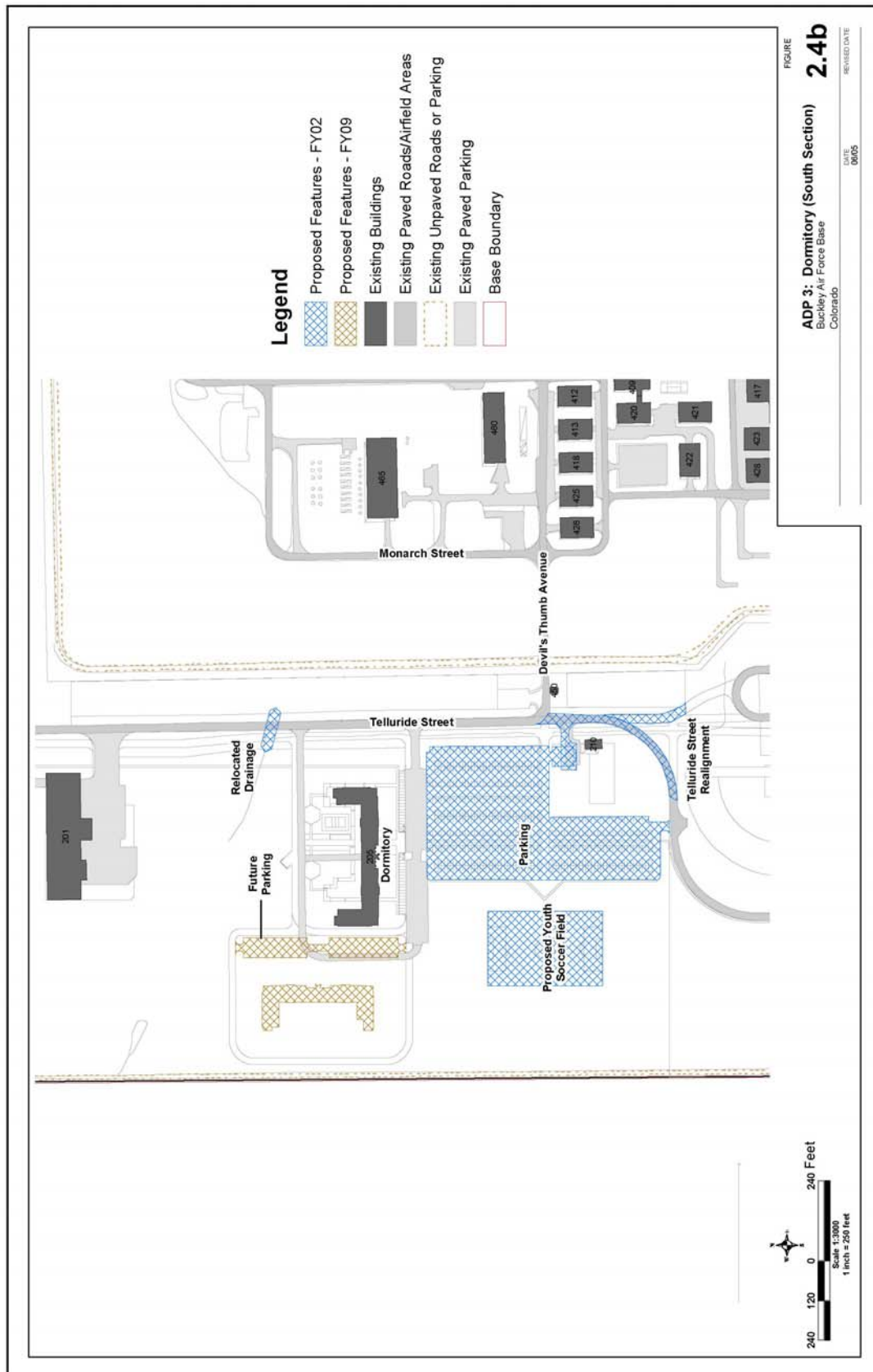
- Provide one additional dormitory.
- Determine locations for the pharmacy and car wash.
- Locate Synergy relationship between the pharmacy and (BX)/Commissary complex.
- Determine locations for outdoor recreational facilities such as ball fields, basketball courts, and tennis courts.
- Establish a traffic pattern at the new Telluride Gates and along Telluride Street adequate to handle increased volumes of traffic for the privatized housing and BX/Commissary.
- Promote bicycle/pedestrian circulation.
- Plan for future expansion (Buckley AFB 2005a).

Development of this area would include three dormitories, a pharmacy, a fitness center, and Athletic Fields on approximately 70 acres of the total 123 acre ADP. The new Telluride Gate access point is located at 6<sup>th</sup> Avenue along the northern boundary of this ADP, and provides access to dormitories and the Base Exchange (BX)/Commissary. This arrangement would also relieve traffic congestion at the Main Gate (Buckley AFB 2002a). Figures 2.4a and 2.4b show the locations of the Dormitory ADP and proposed facilities. Final individual facility sitings are subject to change within the ADP.

Description of the Proposed Action and Alternatives



Description of the Proposed Action and Alternatives





Infrastructure and utilities are available within the Dormitory ADP, however, increased traffic volumes may require road upgrades as part of this ADP. The Dormitory ADP currently contains the BX/Commissary, Space Operations Warehouse, Exchange Service Station, Dormitory #1 and #2, Space Operations Administrative Support Facility, Fitness Center, and the Gas Meter House. Table 2.4 shows the additional facilities planned for the Dormitory ADP. Figures 2.4a and 2.4b show new facility locations as north and south sections, respectively. Construction of new facilities would result in approximately 104,067 ft<sup>2</sup> of new building space and 705 parking lot spaces, including additional parking for the Space Operations (Buckley AFB 2005a). The net increase in building square footage (considering construction and demolition projects) would be approximately 103,189 ft<sup>2</sup>. The build-out of sidewalks and paths is included as a portion of the projects planned for this ADP. Primary utilities and infrastructure exist within this ADP. The Fitness Center, Dormitory #2, and the Gas Meter House were recently constructed in this ADP. Demolitions include Building 210 (the Security Forces Kennel), Building 39 (Gas Meter House), and portions of an unnamed street west of Building 28, and a parking lot northwest of Building 28.

<b>Table 2.4: ADP 3 - Dormitory</b>	
<b>Area Development Plan</b>	<b>Component Projects</b>
Dormitory	<ul style="list-style-type: none"> <li>• Fitness Center</li> <li>• Dormitory #2</li> <li>• Dormitory #3</li> <li>• Car Wash</li> <li>• Pharmacy</li> <li>• Gas Meter House</li> <li>• Space Operations Parking</li> <li>• Winterpark Avenue</li> <li>• Athletic Fields and Courts</li> <li>• Athletic Field Concession</li> <li>• Fitness Center Swimming Pool Addition</li> <li>• Demolition of Building 39 (Gas Meter House)</li> <li>• Demolition of Building 210 (Security Forces Kennel)</li> <li>• Demolition of Winter Park Avenue Parking Lot and Street West of Dormitory #1</li> <li>• Demolition of Street and Parking Lot in the Vicinity of Building 28 and Portions of Beaver Creek Street</li> </ul>



#### 2.1.4 ADP 4: Aspen Corridor

The Aspen Corridor ADP was developed to enhance the landscaped image along the northern 0.5 miles of Aspen Street between Keystone Avenue on the north and Beaver Creek Street on the south. Aspen Street is the primary north/south roadway through Buckley AFB. Objectives of this ADP are:

- Design landscaping techniques to be used along Aspen Street between Keystone Avenue and the Main Gate.
- Enhance existing pedestrian walks located along Aspen Street.
- Improve the appearance of the west edge of the drainage basin east of Aspen Avenue and south of Steamboat Avenue (Buckley AFB 2005a).

The Aspen Corridor ADP contains a large number and square footage of existing buildings including:

Table 2.5: Existing Major Buildings in the Aspen Corridor ADP		
Existing Buildings	Name	Square Footage
Building 600	Medical Services	15,030
Building 606	Mission Support Group Headquarters	42,730
Building 620	Security Police Operations	10,540
Building 630	Airman Dining Hall, Detached	11,870
Building 706	Airman Dining Hall/Wing HQ	25,280
Building 725	Child Development Center	20,670
Building 730	Reserve Forces Training	26,420
Total		152,540

Construction projects planned for the Aspen Corridor ADP are listed in Table 2.6 and proposed locations are depicted in Figures 2.5a and 2.5b (as north and south sections, respectively). The Fire Station and Child Development Center additions have already been completed. The Construction of new facilities would result in approximately 72,825 ft<sup>2</sup> of new building space and 267 parking lot spaces. Development of this ADP would occur on approximately 44 of the 120 acres. Final individual facility sitings are subject to change within

the ADP. Primary utilities and infrastructure exist within this ADP. Demolitions planned as part of the Aspen Corridor ADP include the Existing Clinic Parking Area and a portion of Beaver Creek Street in the vicinity of Building 600.

<b>Table 2.6: ADP 4 - Aspen Corridor</b>	
<b>Area Development Plan</b>	<b>Component Projects</b>
Aspen Corridor	<ul style="list-style-type: none"> <li>• Aspen Street Landscaping</li> <li>• Communications Building Addition (Building 730)</li> <li>• Clinic Addition (Building 600)</li> <li>• Clinic Warehouse</li> <li>• New Dedicated Fire Water Main and Laterals</li> <li>• CDC Addition (Building 725)</li> <li>• Repair Parking Lot East of Building 471</li> <li>• Demolish Roads and Parking Lot Adjacent Building 600 (Clinic Parking Area)</li> </ul>

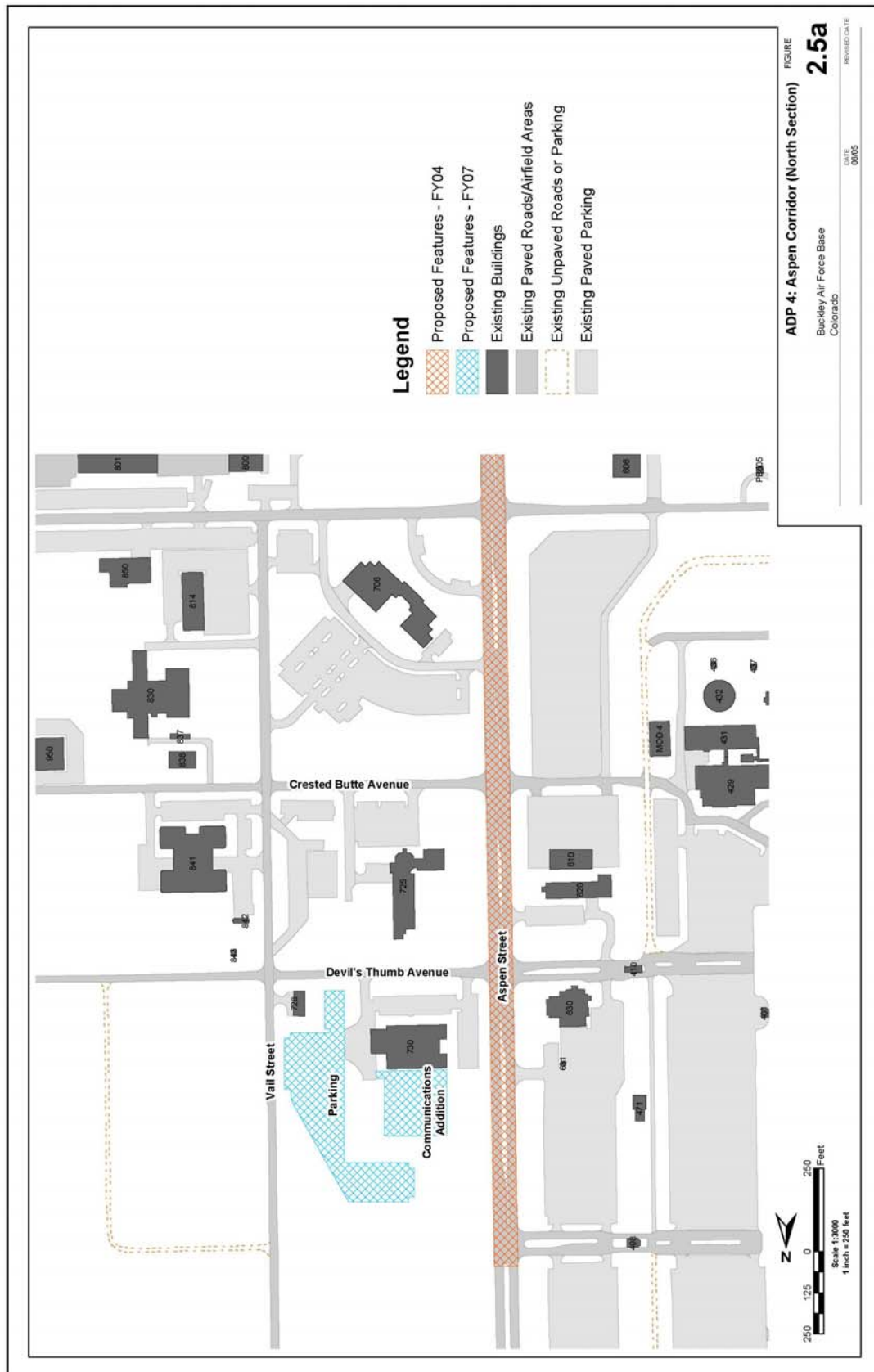
### **2.1.5 ADP 5: Community Center**

The Community Center ADP would be constructed to provide a variety of services vital to the population supported by Buckley AFB. This 57-acre ADP is located south of the Space Operations area along Breckenridge and A-Basin Avenues, and west of Aspen Street. Objectives of the Community Center ADP are:

- Develop a centrally located, convenient, Community Center for convenience of base residents and visitors.
- Use Building 606 as a symmetrical facility to anchor the eastern end of the site.
- Promote pedestrian traffic and limit automobiles.
- Provide capability for future expansion.
- Design parking lots to serve multiple community center facilities and functions.
- Orient buildings and parking lots to work with local climate.
- Maintain mountain views to the south and southwest.
- Provide aesthetically pleasing landscaping, using Xeriscape design principles, landscape buffers, and visual barriers.

- Create a sense of community and a Buckley AFB image (Buckley AFB 2005a).

The location of the Community Center ADP and related structures are shown in Figure 2.6, however, final structure sitings are subject to change within the ADP. The ADP would include important social and educational facilities including the Youth Center, Chapel, Education Center, Consolidated Services Facility, Skills Development Center, and Visitor's Quarters/Temporary Lodging Facility (VQ/TLF), with the development totaling approximately 41 of the 57 acres in this ADP. Demolitions include Buildings 300, 302, 306, 310, 341, 344 (HAZMAT storage building), and PB 605 (tuff-shed on skids, used for gas mask training).



Description of the Proposed Action and Alternatives

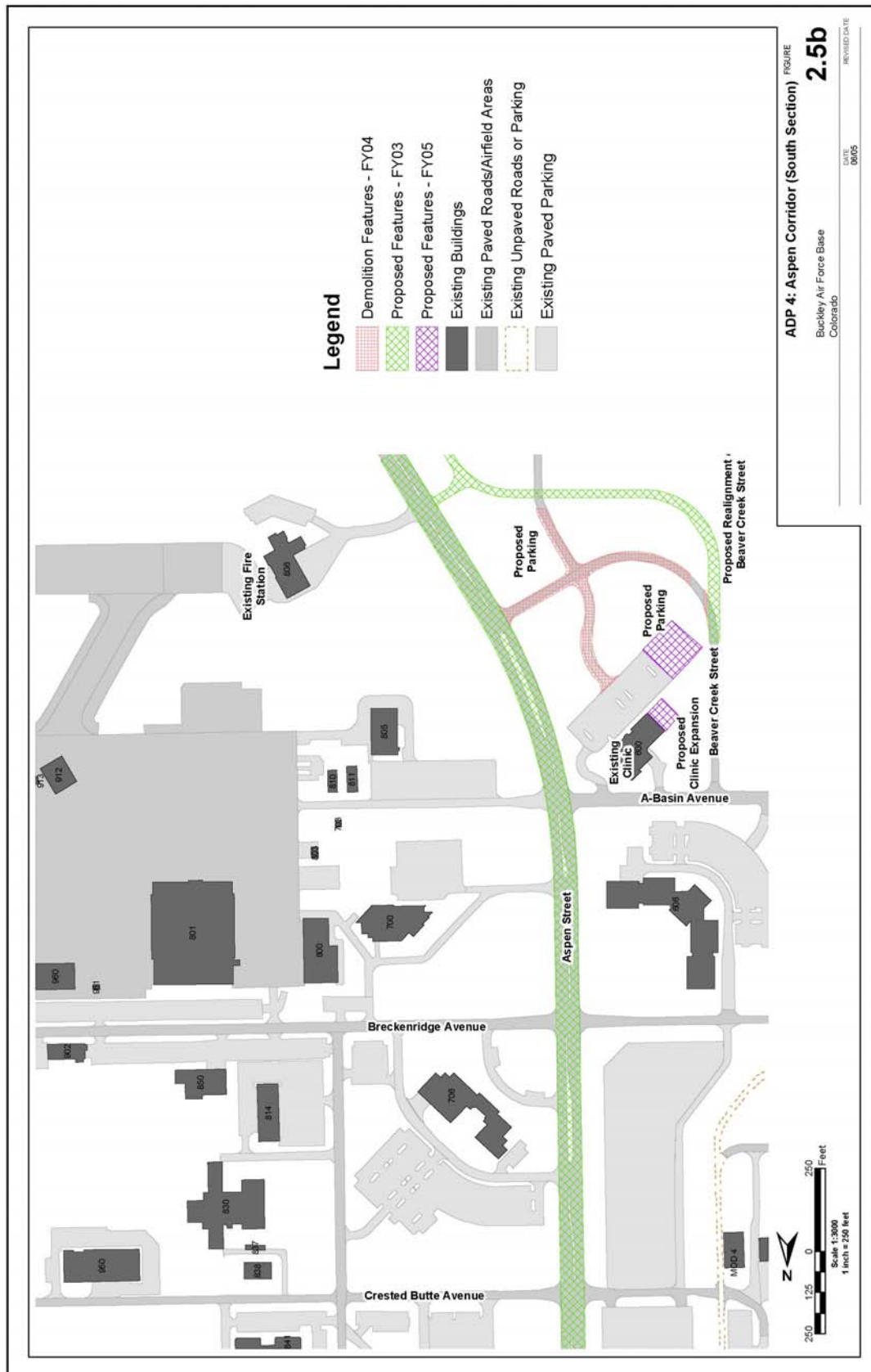
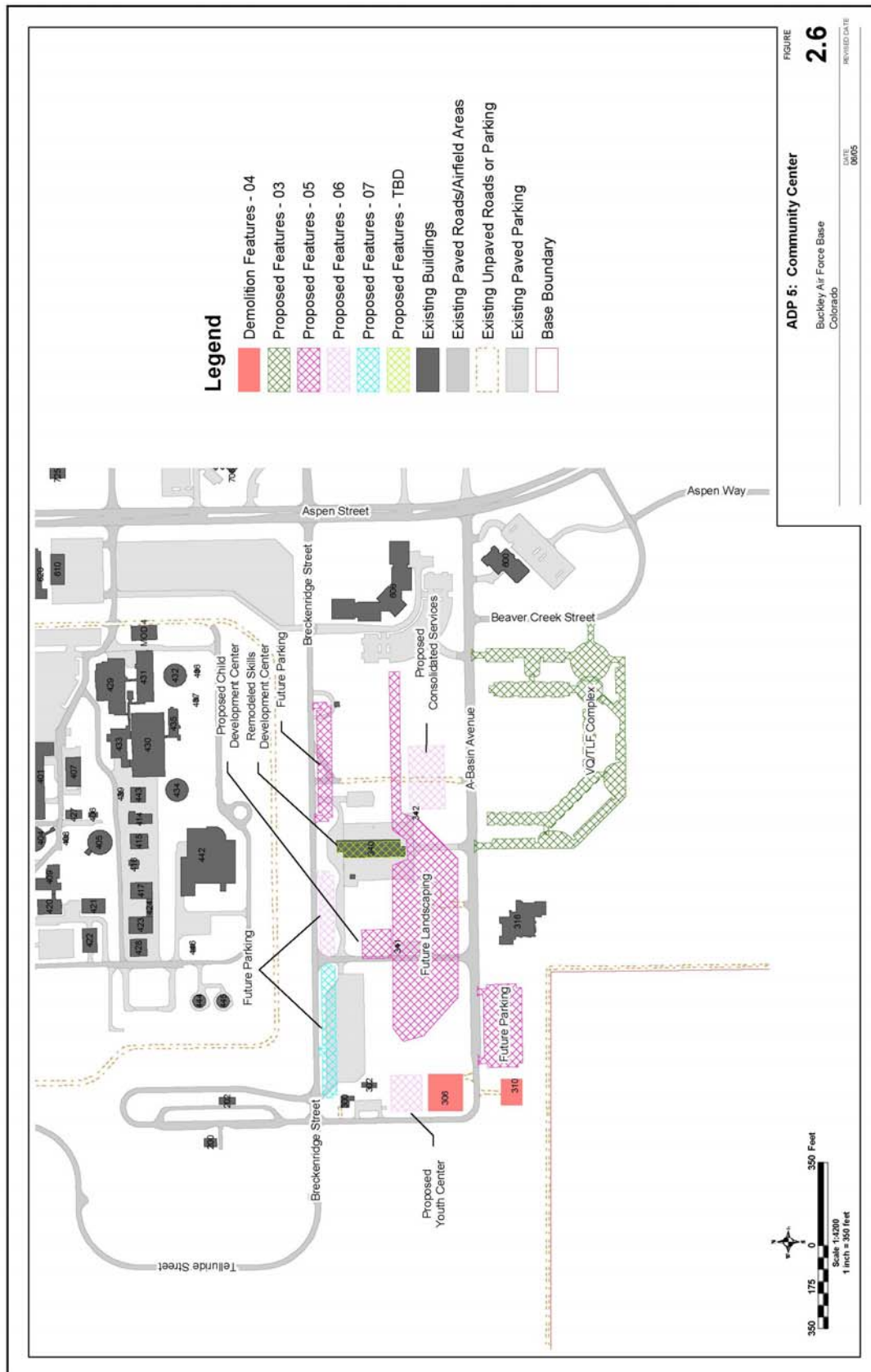


Table 2.7 lists the new facilities proposed for the Community Center ADP. Five of the facilities are linearly aligned in close proximity between Breckenridge and A-Basin Avenues to create a mall atmosphere, while the Chapel and VQ/TLF are located due southwest and south of A-Basin Avenue, respectively. Utilities are available for this ADP, but may require upgrading to accommodate the Community Center. The build-out of walkways and paths is included as a portion of the projects planned for this ADP. These facilities combined add approximately 167,905 ft<sup>2</sup> of building space and 1,365 parking spaces to the installation (Buckley AFB 2002a). There would be a net increase of approximately 162,589 ft<sup>2</sup> (considering construction and demolition projects). The ADP layout is shown in Figure 2.6.

Table 2.7: ADP 5 - Community Center	
Area Development Plan	Component Projects
Community Center	<ul style="list-style-type: none"> <li>• Chapel</li> <li>• CDC</li> <li>• Consolidated Services Facility</li> <li>• Skills Development Center Remodel (Building 340)</li> <li>• Education Center</li> <li>• Youth Center</li> <li>• VQ/TLF</li> <li>• Demolition of Buildings 300* and 302* (Petroleum Operations Buildings) and Building 341* (Vehicle Fuel Station) *</li> <li>• Demolition of Building 310* (H-70 (Hydrazine) Fuel Storage Building)</li> <li>• Demolition of Building 306 (Entomology Shop)</li> <li>• Demolition of Building 344 (Hazardous Storage Building)</li> <li>• Demolition of Building PB 605 (Gas Mask Training Building)</li> <li>• Central Mall (landscaping, sidewalks)</li> </ul>

\* Demolition of Buildings 300, 302, 310, and 341 are part of the consolidated fuels construction project.

Description of the Proposed Action and Alternatives



Because this portion of the installation historically housed “back of the house” facilities such as the fire training facility and fuel storage, demolition of facilities that are not compatible with community service facilities would precede development of new facilities. Facilities planned for demolition are shown on Table 2.8 below.

<b>Table 2.8: Buildings Scheduled for Demolition or Relocation in the Community Center ADP</b>		
<b>Existing Buildings</b>	<b>Name</b>	<b>Square Footage</b>
Building 200* and associated fuel storage tank/facility	Liquid Fuel Pump Station	1,840
Building 300*	Petroleum Operations Building	1,990
Building 302*	Petroleum Operations Building	1,370
Building 306	Entomology Building	1,160
Building 310*	Special Fuel Facility	820
Building 341*	Vehicle Fuel Station	216
Building 344	Hazardous Material Storage	216
Building PB 605	Gas Mask Training Building	440
Total		5,988

\* Demolition of Buildings 200, 300, 302, 310, and 341 are part of the consolidated fuels construction project.

### 2.1.6 ADP 6: Industrial Support

The Industrial Support ADP is a 74-acre industrial park designed to collocate industrial functions in an area isolated from incompatible land uses, such as housing and community service facilities. New facilities in this ADP include the consolidated fuel storage facility, the entomology shop, a hazardous materials (HAZMAT) pharmacy for issuing hazardous materials, hazardous waste storage facility, an outdoor recreation equipment rental facility, a logistics complex, vehicle maintenance facility, Fire Station addition, CE Warehouse, and the Auto Skills Center (Buckley AFB 2005a). The entomology shop and the addition to the Fire Station were recently constructed in this ADP. The objectives of this ADP are:

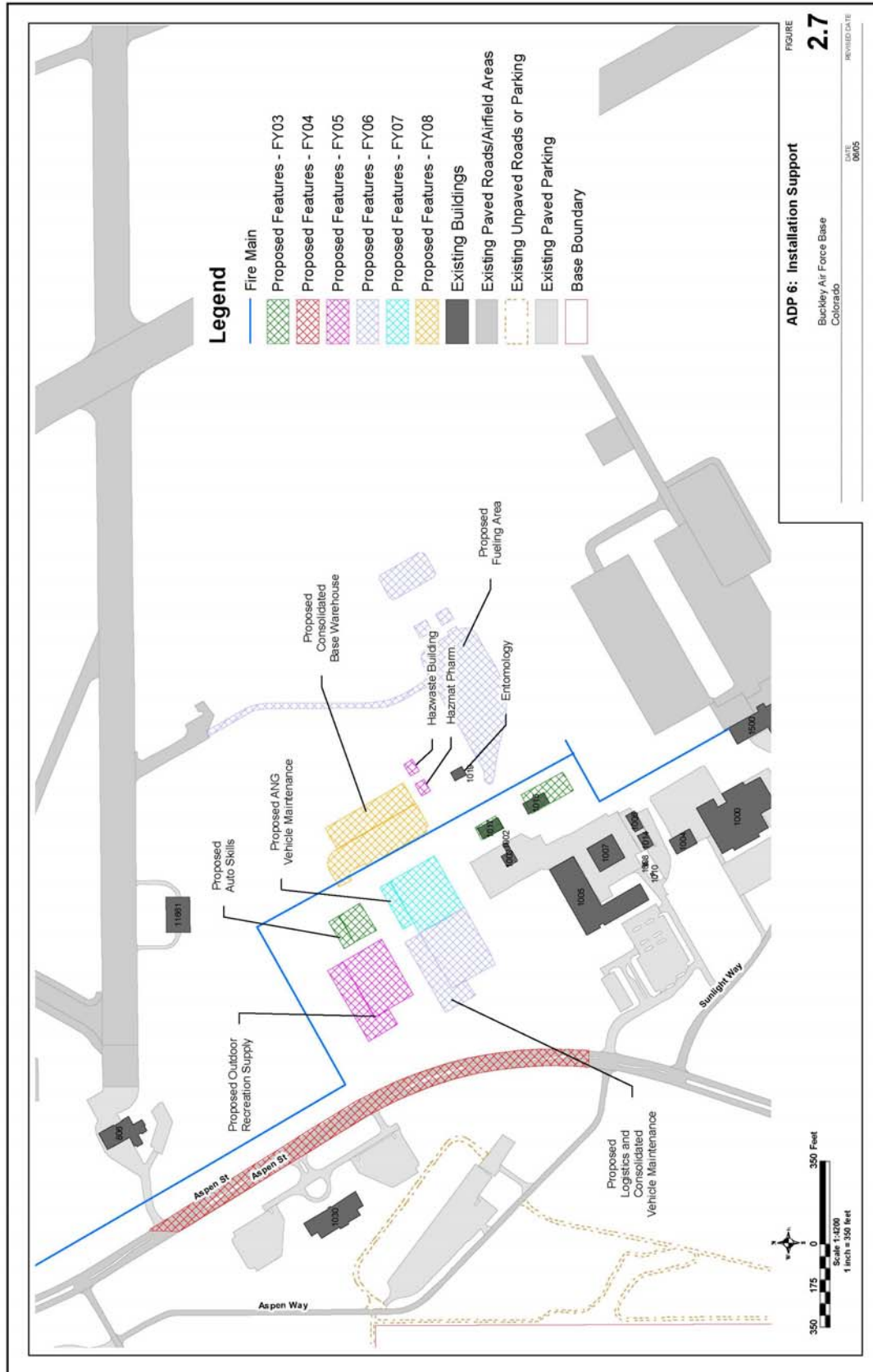
- Relocate industrial functions from locations adjacent to the privatized housing area to alleviate incompatibilities.
- Create an industrial park environment for those activities support the installation as a whole.



- Improve safety by siting industrial activities that support flying operations to a site closer to the airfield.
- Collocate similar COANG and USAF activities.
- Design the area to accommodate future expansion (Buckley AFB 2005a).

This ADP would be constructed on largely undeveloped land located east of Aspen Street and north of the existing Civil Engineering (CE) Complex, as shown in Figure 2.7. Seven buildings currently exist within the ADP: the Fire Station 1, the Hush House, and the CE Complex Buildings 1000, 1004, 1005, 1006, and 1007.

The eleven new facilities proposed for the Industrial Support ADP are listed in Table 2.9, and proposed locations are depicted in Figure 2.7. Final individual facility sitings are



subject to change within the ADP. The build-out of walkways and paths is included as a portion of the projects planned for this ADP. Of the 74 acres in the Industrial Support ADP, approximately 61 acres of undeveloped land would be used to provide the necessary facility square footage, buffer zones, roadways and parking lots. This ADP is sized to meet safety requirements for isolating the two 210,000-gallon fuel tanks and associated pumping, control and military fueling station areas located on the southeastern portion of the ADP. The Industrial Support ADP also reserves substantial acreage for future expansion. Construction of new facilities at the ADP would result in a net increase of approximately 161,375 ft<sup>2</sup> of building space (considering construction and demolition projects) and 573 parking lot spaces to the installation (Buckley AFB 2005a).

**Table 2.9: ADP 6 - Industrial Support**

Area Development Plan	Component Projects
Industrial Support	<ul style="list-style-type: none"> <li>• Transportation System/Aspen Street</li> <li>• Logistics Complex</li> <li>• Vehicle Maintenance</li> <li>• Outdoor Recreation Supply</li> <li>• Auto Skills Center</li> <li>• Consolidated Base Warehouse</li> <li>• Entomology Shop</li> <li>• HAZMAT Pharmacy</li> <li>• Hazardous Waste Building</li> <li>• Consolidated Fuels Storage (POL Operations Building and POL Bulk Operations Building Storage)</li> <li>• CE Warehouse</li> <li>• Fire Station Addition (Building 806)</li> </ul>

The Outdoor Recreation Supply, Auto Skills Center, Logistics Complex, and Vehicle Maintenance buildings are all positioned in proximity to Aspen Street, due to anticipated high daily vehicle volumes and the need for frequent supply access. Although the Consolidated Base Warehouse also requires easy access, it would be located further east to increase separation from the Wing Headquarters complex, which would be located due west across Aspen Street. Similarly, the CE Warehouse is located east of the existing CE Complex to buffer noise generated at this facility. The Entomology Shop and HAZMAT Pharmacy, and Hazardous Waste Building would be located in a relatively isolated position north of the CE Warehouse.

No demolitions are planned as part of this ADP. Utilities and infrastructure are not currently in-place at this ADP, but may be tapped into along Aspen Street.

#### **2.1.7 ADP 7: Headquarters Area**

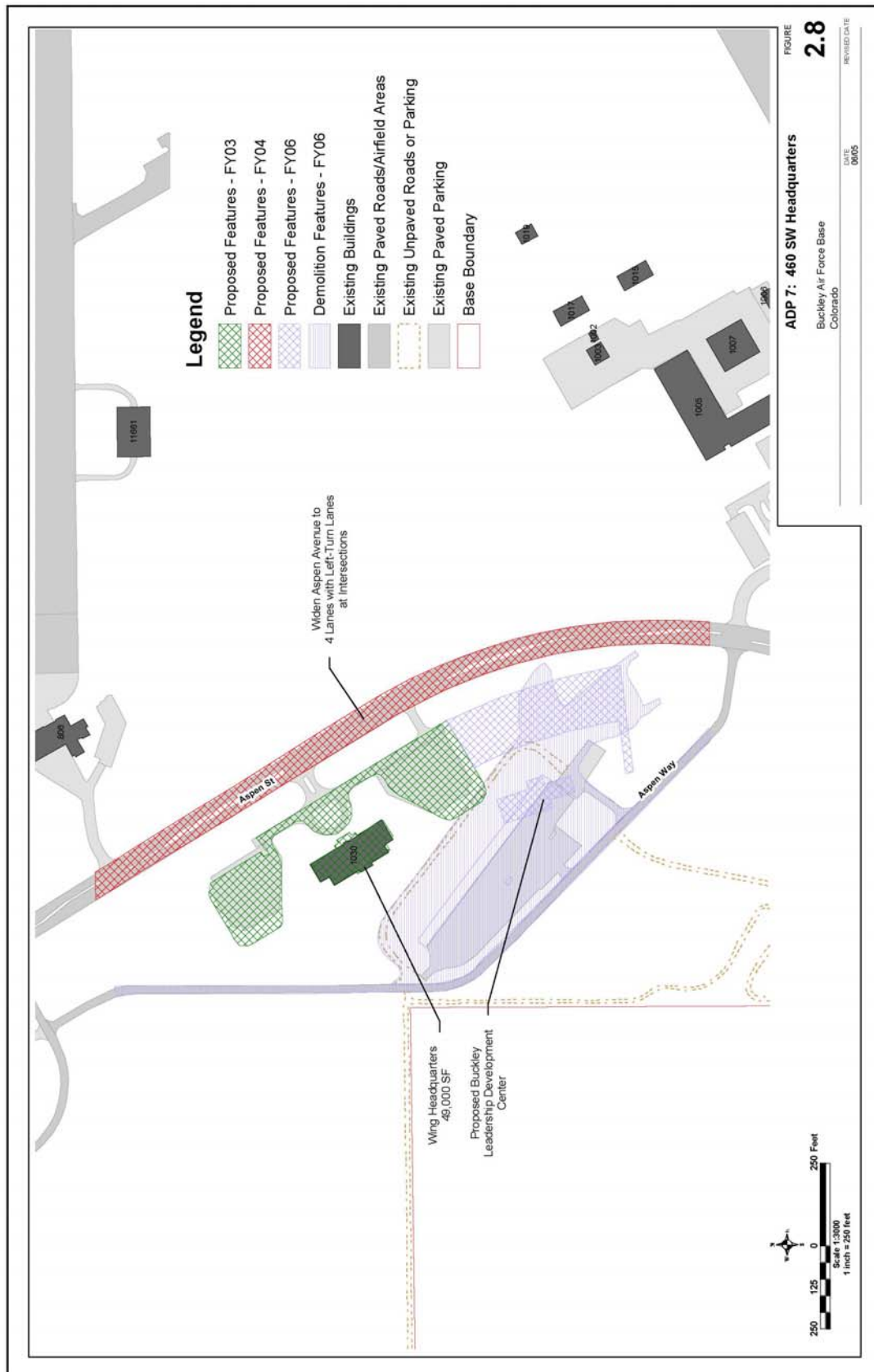
The Headquarters Area ADP would house the new headquarters building and the Leadership Development Center. These high visibility facilities would be constructed on the west side of Aspen Street, west of the Industrial Support ADP, within a 36-acre area. The proposed locations for the two new buildings are shown in Figure 2.8, however, final facility sitings are subject to change within the ADP. Located on high ground with a commanding view of the mountain front to the west, the Headquarters Area ADP would provide a positive, efficient, high profiled command complex for Buckley AFB. The objectives of this ADP are:

- Preserve and enhance mountain views.
- Preserve and enhance the natural environment and wetlands along East Toll Gate Creek.
- Improve quality of life for Buckley AFB workers and residents (Buckley AFB 2005a).

Existing structures within this ADP included Buildings 1011 and 1012, a portion of Aspen Street, and several unpaved roads. All existing facilities would be demolished in preparation for construction of new facilities. New facilities within this ADP are listed in Table 2.10 and would require development of approximately 23 of the 36 acres. A former skeet range discovered on the north side of Building 1011 was cleaned up in 2004. A small portion of the skeet range not addressed by that custodial action remains just west of ADP 7 as a Military Munitions Response Program site. The SW Headquarters Building was recently constructed in this area and buildings 1011 and 1012 have been recently demolished. The golf course driving range was constructed and subsequently removed due to its close proximity to the neighboring community. In addition to the structural facilities, a Base Golf Course is planned to be located southwest of the headquarters and east of the installation boundary. However, the Base Golf Course is not being analyzed in this EA, as the proposed date of construction is beyond the scope of this EA and the details related to this project are insufficient to make a comprehensive evaluation of impacts. New facilities constructed in this ADP would increase installation building square footage by approximately 69,210 ft<sup>2</sup> and add 366 parking lot spaces (Buckley AFB 2005a). The net

increase of building square footage within this the installation (considering construction and demolition projects) would be 44,803 ft<sup>2</sup>.

Description of the Proposed Action and Alternatives



**Table 2.10: ADP 7 - Headquarters Area**

Area Development Plan	Component Projects
Headquarters Area	<ul style="list-style-type: none"> <li>• 460th SW Headquarters</li> <li>• Golf Driving Range</li> <li>• Leadership Development Center</li> <li>• Transportation System/Aspen Ave</li> <li>• Demolition of Building 1011 (Base Storage Facility)</li> <li>• Demolition of Building 1012 (Sanitary Latrine)</li> </ul>

### 2.1.8 ADP 8: Williams Lake

The Williams Lake ADP is designed to provide premier camping and recreation experiences for authorized personnel. Objectives of this ADP are to develop:

- Develop a FamCamp with parking and hookups for recreational vehicles.
- Provide an area for campers using tents.
- Provide an outdoor recreation area designated for nonresident day use. (Buckley AFB 2005a).

The Williams Lake ADP is located at the existing Williams Lake site, which is east of and isolated from, the cantonment area. This ADP is 94 acres in size and is surrounded by an undeveloped, open space portion of the installation. The area includes a 17-acre lake and a partially treed drainage channel that flows north to Sand Creek, and upland mixed grass prairie habitat. Although isolated from other infrastructure and activity centers so that outdoor recreation activities are properly isolated from less compatible facilities, this ADP is within the day/night noise level (DNL) 70-74 decibel (dB) noise zone created by the airfield (Buckley AFB 2002a). Utility tie-ins are available along adjacent Steamboat Avenue. The only existing buildings are a small cabin along the northwest shore, and a bathhouse (restrooms) and two covered pavilions, which were recently constructed, on the west shore of Williams Lake.

The Williams Lake ADP would be developed on approximately 32 of the 94 acres around a core area that contains an existing cabin that is used for small organizational activities, and is designed to provide separate areas for day-users, tent camping, and RV camping. These

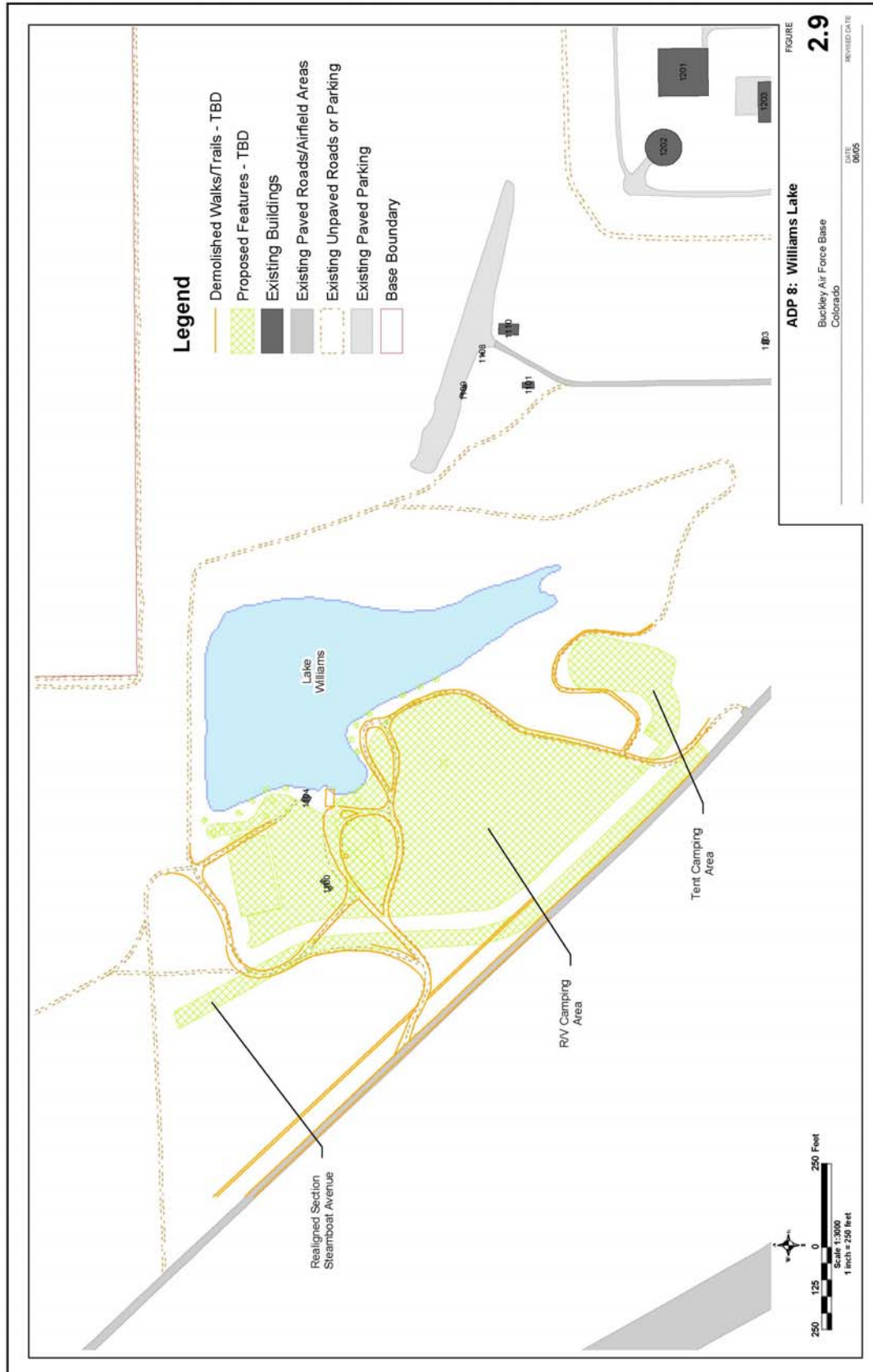
facilities are listed in Table 2.11, and proposed locations of individual components are shown in Figure 2.9. Surrounding the cabin on the west shore of Williams Lake would be parking for 38, 50-foot RVs. A 10-space tent site area would be located south of, and separate from the RV area. Each tent site would consist of a 30-foot parking space, a pea-graveled and redwood edged tent site, and a composting restroom. An additional 176 day-use parking spaces would be supplied by two parking lots established north of the RV area. Day-use activity areas including a sand beach and volleyball court, playground, restroom, and picnic area would be located between the day-use parking area and the lake. Jogging/walking paths would connect these activity areas and extend along Steamboat Avenue as part of the installation-wide trail network (Buckley AFB 2002a). All final individual facility sitings are subject to change within the ADP.

<b>Table 2.11: ADP 8 – Williams Lake</b>	
<b>Area Development Plan</b>	<b>Component Projects</b>
Williams Lake	<ul style="list-style-type: none"> <li>• Realign Steamboat Avenue</li> <li>• Relocate Jogging Trail</li> <li>• Core Area, Picnic shelters and sites</li> <li>• RV Parking</li> <li>• Playground</li> <li>• Two Pavilions</li> <li>• FAM Camp, including Restroom&gt;Showers</li> <li>• Tent Camping Area</li> </ul>

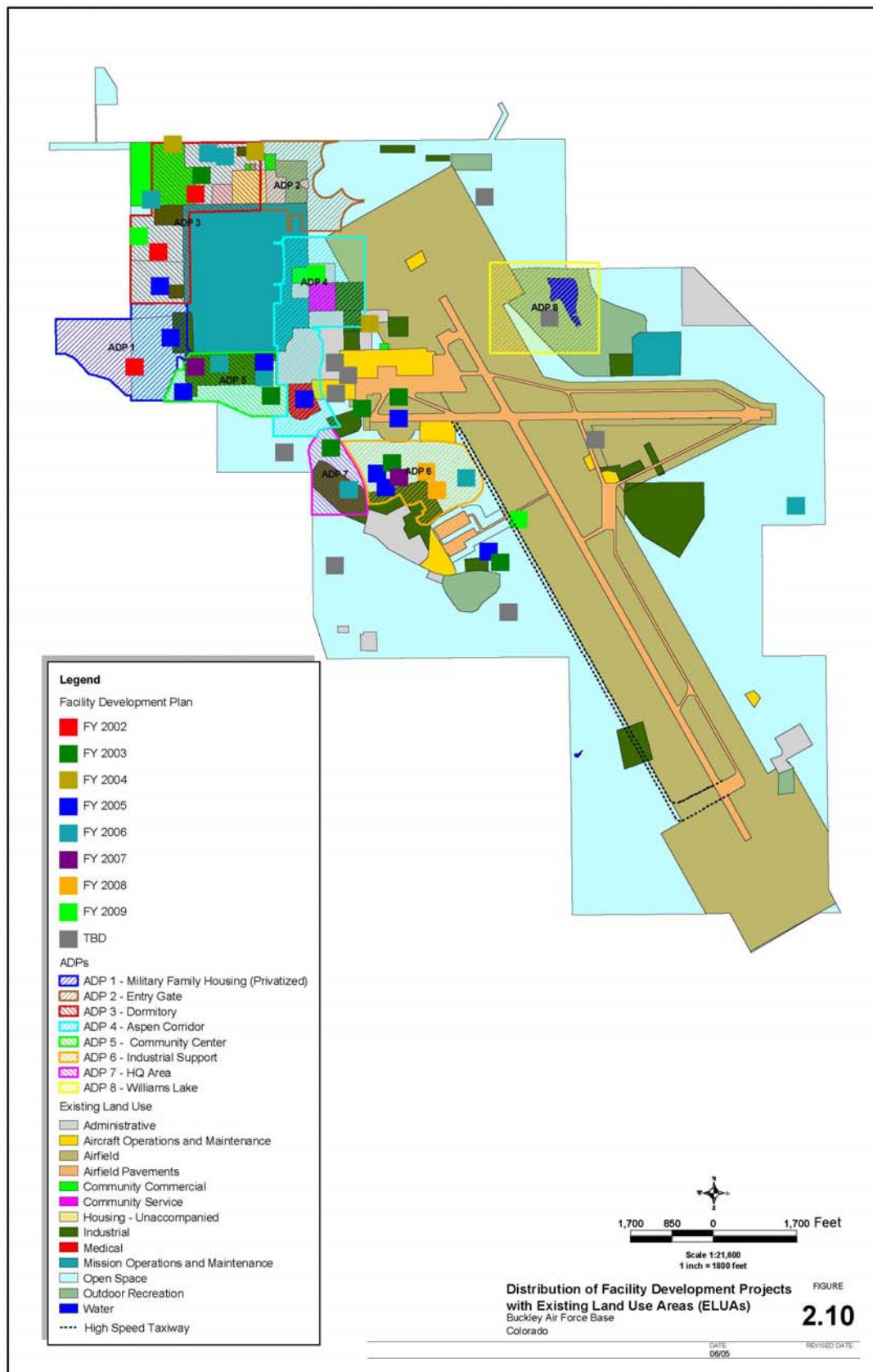
### 2.1.9 Existing Land Use Area Projects

Seven ELUAs at the installation have one or more proposed facility development or demolition projects scheduled to occur during the period of the Proposed Action. In the long-term, these projects would change the distribution of existing land uses in conformance with the proposed ADPs. Table 2.1b lists projects proposed for the seven ELUAs: Open Space, Aircraft Operations and Maintenance, Airfield/Aircraft Pavement, Mission Operations and Maintenance, Industrial, 6<sup>th</sup> Avenue, and Special Categories (Buckley AFB 2002a). Figure 2.10 shows the distribution of Facility Development Projects. Changes to each of the ELUA's as a result of the programmed projects are briefly described below. Final individual facility sitings within each ELUA are subject to change.





Description of the Proposed Action and Alternatives



### 2.1.9.1 Open Space ELUA

The Open Space ELUA is comprised of acreages distributed throughout the installation which are not specifically designated for other uses. Nearly half of the existing 2,388 acres of open space are to remain undeveloped because they are either part of the airfield, explosive quantity distance (QD) arcs, or the exclusionary zone. A New Munitions and Hazardous Materials Gate, Outdoor Arms Range and Live Fire Training Facility would be constructed within this ELUA. The concrete foundations were recently constructed for the Fire Training Facility. The component projects for the Open Space ELUA are shown on Table 2.12.

Table 2.12: Open Space ELUA	
Existing Land Use Area	Component Projects
Open Space	<ul style="list-style-type: none"> <li>• New Munitions and Hazardous Materials Gate</li> <li>• Live Fire Training Facility</li> <li>• Outdoor Small Arms Range</li> <li>• Demolition of Building Radio Relay (Building 1620)</li> <li>• Demolition of Building Reserve Forces (Building 1632)</li> <li>• Demolition of Building Electrical Shop (Building 1631)</li> <li>• Demolition of Building Marine Area Foundations</li> <li>• Vail Street Improvements</li> </ul>

### 2.1.9.2 Aircraft Operations and Maintenance ELUA

The Aircraft Operations and Maintenance ELUA is comprised of acreage located in the northwest and west-central portions of the Airfield. As shown on Table 2.13, six construction projects are planned, in progress, or completed for this ELUA, including the Control Tower, Engine Shop Addition, Runway and Taxiway Ramp Repairs, H-70 (Hydrazine) Fuel Storage, Army Aviation Support Facility, Freight Transfer Facility, new Squadron Operations Facility, and the Weapons Release Complex Expansion (Buckley AFB 2002b). The Control Tower, and the H-70 Fuel Storage buildings have been constructed in this ELUA. These Aircraft Operations and Maintenance projects would increase building density within these ELUAs.

<b>Table 2.13: Aircraft Operations and Maintenance ELUA</b>	
<b>Existing Land Use Area</b>	<b>Component Projects</b>
Aircraft Operations and Maintenance	<ul style="list-style-type: none"> <li>• Control Tower</li> <li>• Engine Shop Addition (Building 700)</li> <li>• Runway and Taxiway Ramp Repairs</li> <li>• H-70 (Hydrazine) Fuel Storage</li> <li>• Army Aviation Support Facility</li> <li>• Weapons Release Complex Expansion</li> <li>• Freight Transfer Facility</li> <li>• Replace Squadron Operations Facility</li> </ul>

### 2.1.9.3 Airfield/Aircraft Pavement ELUA

The Airfield/Aircraft Pavement ELUA is centered on the Buckley AFB Airfield, located in the central portion of the installation. Seven construction projects are proposed for this ELUA as shown in Table 2.14. The projects include Runway and Taxiway Ramp Repairs; Approach Lighting Construction; ADAL Access Roads; Taxiways A and K (A&K) Repairs; Permanent Alert Shelters, Crew Quarters; West Taxiway and Arm/Disarm Pads (Buckley AFB 2002b); and a high speed taxiway. Airfield Pavement land uses would improve the connectivity with the Aircraft Operations and Maintenance and Industrial ELUAs.

<b>Table 2.14: Airfield/Aircraft Pavement ELUA</b>	
<b>Existing Land Use Area</b>	<b>Component Projects</b>
Airfield/Aircraft Pavement	<ul style="list-style-type: none"> <li>• Runway and Taxiway, Ramp Repairs</li> <li>• Approach Lighting Construction</li> <li>• ADAL Access Roads</li> <li>• Taxiways A&amp;K Repairs</li> <li>• Permanent Alert Shelters and Crew Quarters</li> <li>• West Taxiway and Arm/Disarm Pads</li> <li>• Highspeed Taxiway</li> </ul>

### 2.1.9.4 Mission Operations and Maintenance ELUA

The Mission Operations and Maintenance ELUA are located north of Breckenridge Avenue and south of Steamboat Avenue in the northwest portion of the installation. Although there are no plans to expand this area, as shown on Table 2.15, five construction projects are scheduled for this ELUA; the ADAL Space Based Infrared System (SBIRS) Mission Control, SBIRS

Operations Support Facility, SBIRS Remote Ground Station, placement of two DSOC temporary 33,000 ft<sup>2</sup> modular facilities; and construction of permanent DSOC replacement facilities in FY08. Buildings 429 and 431 would be demolished once the SBIRS Operations Support Facility is occupied. If the installation security fence is relocated, a portion of this ELUA could potentially be designated as Outdoor Recreation space.

The permanent facility would create the new DSOC, which would replace the temporary modular facilities with a new 200,000 ft<sup>2</sup> facility (Buckley AFB, 2004a).

<b>Table 2.15: Mission Operations and Maintenance ELUA</b>	
<b>Existing Land Use Area</b>	<b>Component Projects</b>
Mission Operations and Maintenance (Admin)	<ul style="list-style-type: none"> <li>• ADAL SBIRS Mission Control; Space Operations Area</li> <li>• Two Temporary DSOC modular facilities</li> <li>• Permanent DSOC Facilities</li> <li>• SBIRS Operations Support Facility</li> <li>• SBIRS Remote Ground Station</li> <li>• Demolish buildings 429 and 431</li> </ul>

#### 2.1.9.5 Industrial ELUA

Industrial functions currently located northwest of the airfield would be relocated to the southern Industrial ELUA on the eastern side of Aspen Street and extending to the Airfield. A new Air National Guard Civil Engineer Complex has been recently constructed in this ELUA. Portions of the current Northern Clear Zone would revert to Open Space after Buildings 940 and 950 are demolished. Future Industrial land use would be added to the northeastern side of the Northern Clear Zone. The Facility Development projects that are scheduled for the Industrial ELUAs area are shown in Table 2.16 below.

<b>Table 2.16: Industrial ELUA</b>	
<b>Existing Land Use Area</b>	<b>Component Projects</b>
Industrial	<ul style="list-style-type: none"> <li>• Demolition of Building 902 (Old Base Exchange)</li> <li>• Demolition of Building 940 (Traffic Management Facility)</li> <li>• Demolition of Building 950 (Communications Facility)</li> <li>• Demolition of Building 1103 (Pump Station)</li> <li>• Demolition of Building 1606 (Control Tower)</li> <li>• Air National Guard CE Complex</li> </ul>

#### 2.1.9.6 6<sup>th</sup> Avenue ELUA

The 6<sup>th</sup> Avenue ELUA is located along the north boundary of the installation and includes the adjacent 6<sup>th</sup> Avenue roadway. One construction project, widening 6<sup>th</sup> Avenue, is scheduled for this ELUA, as shown on Table 2.17 (Buckley AFB 2002b).

<b>Table 2.17: 6<sup>th</sup> Avenue ELUA</b>	
<b>Existing Land Use Area</b>	<b>Component Projects</b>
6 <sup>th</sup> Avenue	<ul style="list-style-type: none"> <li>• Widen 6<sup>th</sup> Avenue From Airport Boulevard to 6<sup>th</sup> Avenue Gate</li> </ul>

#### 2.1.10 Special Categories ELUA

The Special Categories ELUA includes a firing range and weapons storage areas on the installation. Component acreage is dispersed in five separate locations throughout the installation. Only one area, the 1400 building area located in the southern-most quadrant of the installation and west of the runways, is scheduled for activity under the CIP. This activity consists of the demolition of a firing range located west of Aspen Street in the southern quadrant of the installation (Table 2.18).

Table 2.18: Special Categories ELUA	
Existing Land Use Area	Component Projects
Special Categories	<ul style="list-style-type: none"> <li>• Demolition of Building 1415 (Small Arms Range Building)</li> <li>• Demolition of Building 1411 (Range Supply and Equipment Storage Building)</li> <li>• Demolition of Building 1413 (Range Target Storage and Repair Building)</li> </ul>

## 2.1.11 Demolition and Construction Process Overviews

### 2.1.11.1 Demolitions

Approximately 30 demolition projects are planned during implementation of the CIP (Buckley AFB 2002a). These are listed in Table 2.19 and shown in Figure 2.11. Many demolition projects are tied to the construction of a replacement building; therefore, the proposed construction year can be subject to change. The following four categories of demolitions pertain to the CIP EA:

- Structures potentially containing HAZMATs. Furthermore, an ongoing Site Inspection at this ERP Area of Concern is exploring other potential contamination sources, including petroleum storage tanks, oil/water separators, vehicle maintenance, and civil engineering shops.
- Pavement and Athletic Fields.
- Other Structures.
- Small Arms Range (Buckley AFB 2002a).

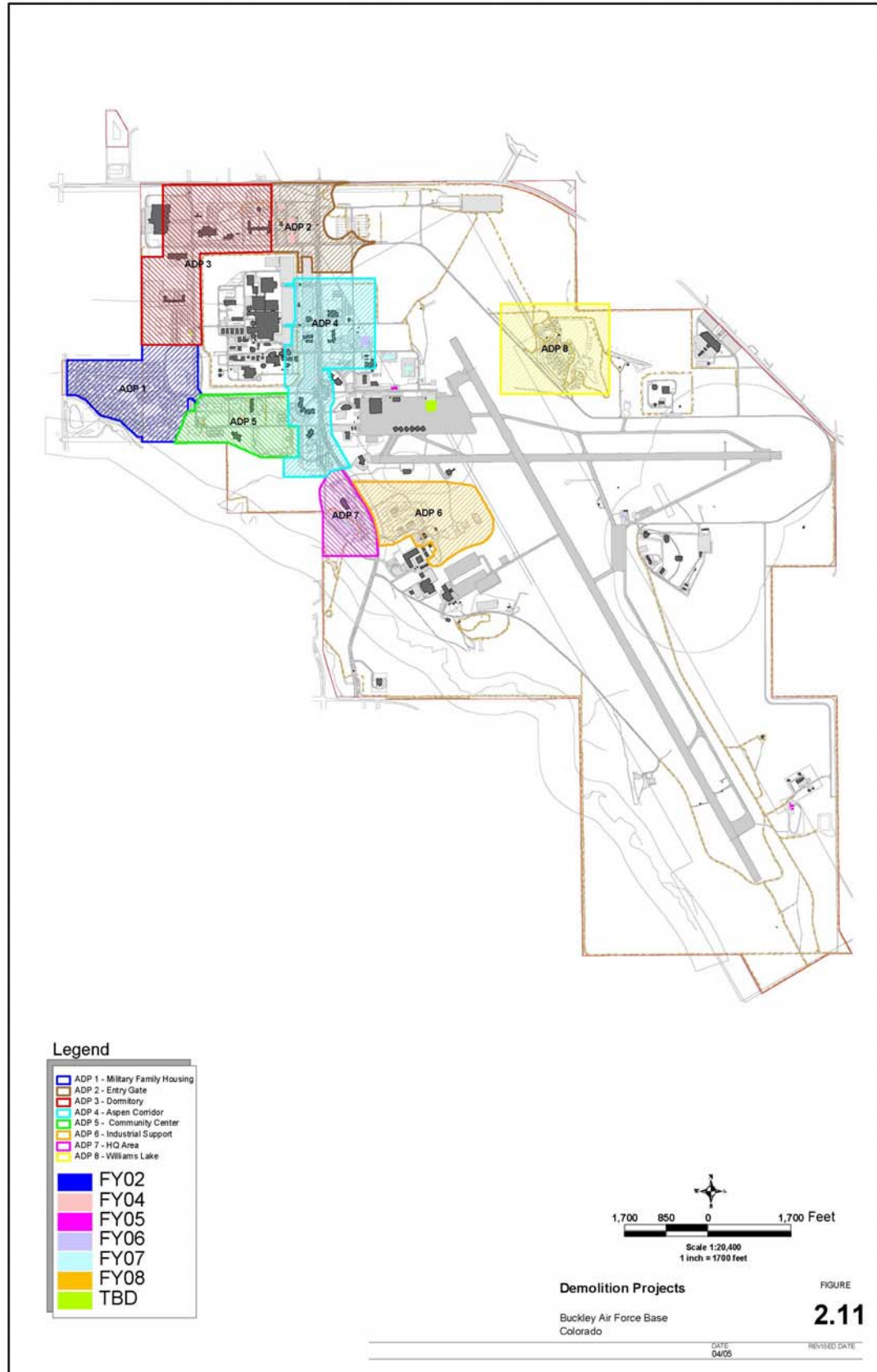
Structures potentially containing HAZMATs include World War II era buildings that were painted with lead-based paint and/or insulated with asbestos. Demolition of other structures may reveal contaminated environmental media, such as soils and groundwater, that would require cleanup under the Environmental Restoration Program (ERP) prior to future development. Facilities of concern in these regards include:

- Demolition of Building 1011 (previously used as a weapons testing range) may reveal soil contaminated with lead and other metals, munitions constituents, and possibly unexploded ordnance.
- Demolition of the fuel storage and dispensing facilities in the community center ADP will involve testing of soil and groundwater for petroleum- or hydrazine-contamination.
- Demolition of the entomology shop may reveal contaminated drains, piping, containers and tanks, as this facility was used to store and mix a variety of pesticides that were applied on the installation.

Soils, groundwater, building materials, drains, piping, containers, tanks and any other suspect materials at these facilities would be treated as contaminated, certified as de minimus materials by a trained professional, and/or tested to certify that they are not hazardous and can be salvaged, recycled, or disposed per all applicable local, state, and federal regulations. All suspect materials, would also be tested as necessary prior to final disposition (e.g., recycle, dispose). All contaminated materials would be disposed or recycled in accordance with all applicable Federal, State (CDPHE), local, and Air Force Regulations.



Description of the Proposed Action and Alternatives



**Table 2.19: CIP Demolition Projects**

<b>Planned Demolition Projects</b>			
<b>Building Number</b>	<b>ADP/ ELUA</b>	<b>Fiscal Year</b>	<b>Building Name or Function/Category</b>
19 <sup>(1)</sup>	ADP 2	FY05	Camana Club/Other Structure
25 <sup>(1)</sup>	ADP 2	FY03	Reserve Component Medical/Other Structure
39	ADP 3	FY04	Gas Meter House/Other Structure
41	ADP 2	FY11	Visitors' Center/Other Structure
200	ADP 1	FY09	Jet Fuel Tanks/Refueling Area/Potential Hazardous Materials
210	ADP 2	TBD	Security Forces Kennel/Other Structure
300	ADP 5	FY09	Petroleum Operations Building/Potential Hazardous Materials
302	ADP 5	FY09	Petroleum Operations Building/Potential Hazardous Materials
306 <sup>(2)</sup>	ADP5	TBD <sup>(3)</sup>	Entomology Shop Building/Potential Hazardous Materials
310 <sup>(2)</sup>	ADP 5	TBD <sup>(3)</sup>	H-70 (Hydrazine) Fuel Storage Building/Potential Hazardous Materials
341	ADP 5	FY09	Vehicle Fuel Station/Potential Hazardous Materials
344	ADP 5	FY09	Hazardous Storage/Potential Hazardous Materials
PB 605	ADP 5	FY09	Gas Mask Training Building/Potential Hazardous Materials
429 <sup>(4)</sup>	ELUA4	FY12	Space Operations Facility
431 <sup>(4)</sup>	ELUA	FY12	Space Operations Facility
950	ELUA 5	FY06	Old Base Exchange/Other Structure
940	ADP 7	FY09	Vehicle Operations/Other Structure
950	ELUA 5	FY087	Communications Facility/Other Structure
1011 <sup>(1)</sup>	ADP 7	FY056	Base Civil Engineer (BCE) Storage/Other Structure
1012 <sup>(1)</sup>	ADP 7	FY06	Sanitary Latrine/Other Structure
1103	ELUA 5	FY06	Pump Station/Other Structure
1411	ELUA 7	FY10	Range Supply and Equipment Storage/Arms Range
1413	ELUA 7	FY10	Range Target Storage and Repair/Arms Range
1415	ELUA 7	FY10	Small Arms Range/Arms Range
1606	ELUA 5	FY06	Control Tower and Crash House Station/Potential Hazardous Materials
1620	ELUA 1	FY06	Radio Relay Building/Other Structure
1631	ELUA 1	FY06	Electrical Shop/Other Structure
1632	ELUA 1	FY06	Reserve Forces/Other Structure
Marine Area Foundations	ELUA 1	FY06	Marine Area Foundations/Other Structure
Temporary Modular Building T-10 (Mod 1)	ADP 2	FY04	Miscellaneous Administrative Functions/Other Structure

**Table 2.19: CIP Demolition Projects**

Planned Demolition Projects			
Temporary Modular Building (T-11 (Mod 3))	ADP 2	FY04	Miscellaneous Administrative Functions/Other Structure
Temporary Modular Building (T-12 (Mod 2))	ADP 2	FY04	Miscellaneous Administrative Functions/Other Structure
East Ramp	ELUA 3	TBD	Large Aircraft Parking/Pavement and Athletic Fields
Ball fields	ADP 2	FY02	Baseball Fields
Winter Park Avenue	ADP 3	FY02	Winterpark Avenue Parking Lot and Street West Of Dormitory #1/Pavement and Athletic Fields
Street and Park adjacent to Building 28	ADP 3	FY04	Street and Parking Lot in the Vicinity of Building 28 and Portions of Beaver Creek Street/Pavement and Athletic Fields

- (1) Buildings have been recently demolished.
- (2) Buildings may be adapted and used in a land-use compatible way (e.g., former H-70 (Hydrazine) Fuel Storage building is currently being used as the Airman's Attic and the Entomology Building may be used for temporary outdoor recreation equipment rental.
- (3) TBD To Be Determined for projects scheduled beyond 2010 (year of demolition currently unknown/unspecified).
- (4) Buildings 429 and 431 recently identified; therefore, they do appear on Figure 2.11

### 2.1.11.2 Construction

The CIP includes construction of more than 80 structures, parking lots, pedestrian paths, roads and amenity areas such as Athletic Fields and campgrounds at Buckley AFB. Construction of each facility would follow the standard USAF site preparation and construction process. Construction projects within each of the eight ADPs would occur in annual phases, and with the exception of the Privatized Housing ADP, would result in only a portion of the ADP being developed during a particular FY. Due to the single usage (family residences) and lack of existing infrastructure at the site of the Privatized Housing ADP, it is likely that the entire 71-acre area would undergo a single site preparation within the scheduled FY.

Site preparation consists of ground clearing to remove vegetation and debris followed by soil grading and compaction to achieve appropriate load-ratings. Erosion control and structures to control runoff flow rates and volumes, such as erosion fencing, temporary drop structures and retention basins, would be used. Next, utilities would be channeled into the subsurface and building materials and equipment would be stockpiled at designated storage sites at or adjacent

to the new facility locations. The structures would be erected and paving and landscaping would be added.

## **2.2 DESCRIPTION OF ALTERNATIVES TO THE PROPOSED ACTION**

### **2.2.1 Alternatives Considered but Eliminated from Further Study**

Alternatives considered but dismissed from further study included relocation of existing and new mission components to other USAF Space Command (AFSPC) installations.

Alternative locations for 460th SW mission facilities were considered programmatically by AFSPC prior to committing to the Buckley AFB location. Other locations considered were found less satisfactory and more expensive to accomplish than conversion of the BANGB to an USAF Base (BANGB, 2000a).

Mission requirements for Buckley AFB define minimum facility and assigned military personnel needs. The GP and the CIP are designed to provide the required infrastructure and facilities, and are intended to culminate in orderly construction of necessary infrastructure and facilities. Consideration of other sites was facilitated during earlier stages of planning at the major command level. Layout and design options were considered during development of the GP. This process included relevant users, planners, designers and engineers from 460th SW and tenant organizations. The process also considered existing and planned land uses, consolidating and collocating facilities with like or compatible land uses, access routes, and availability of existing infrastructure and utilities. The Buckley AFB GP established a comprehensive and systematic development plan for the base through the year 2020. The GP was awarded an architectural and planning award from the USAF. The siting of all construction projects under this EA is compatible with the GP. For this reason alternate sitings for these projects are not considered as alternative actions in this EA. However, the following alternative to the Proposed Action is also presented.

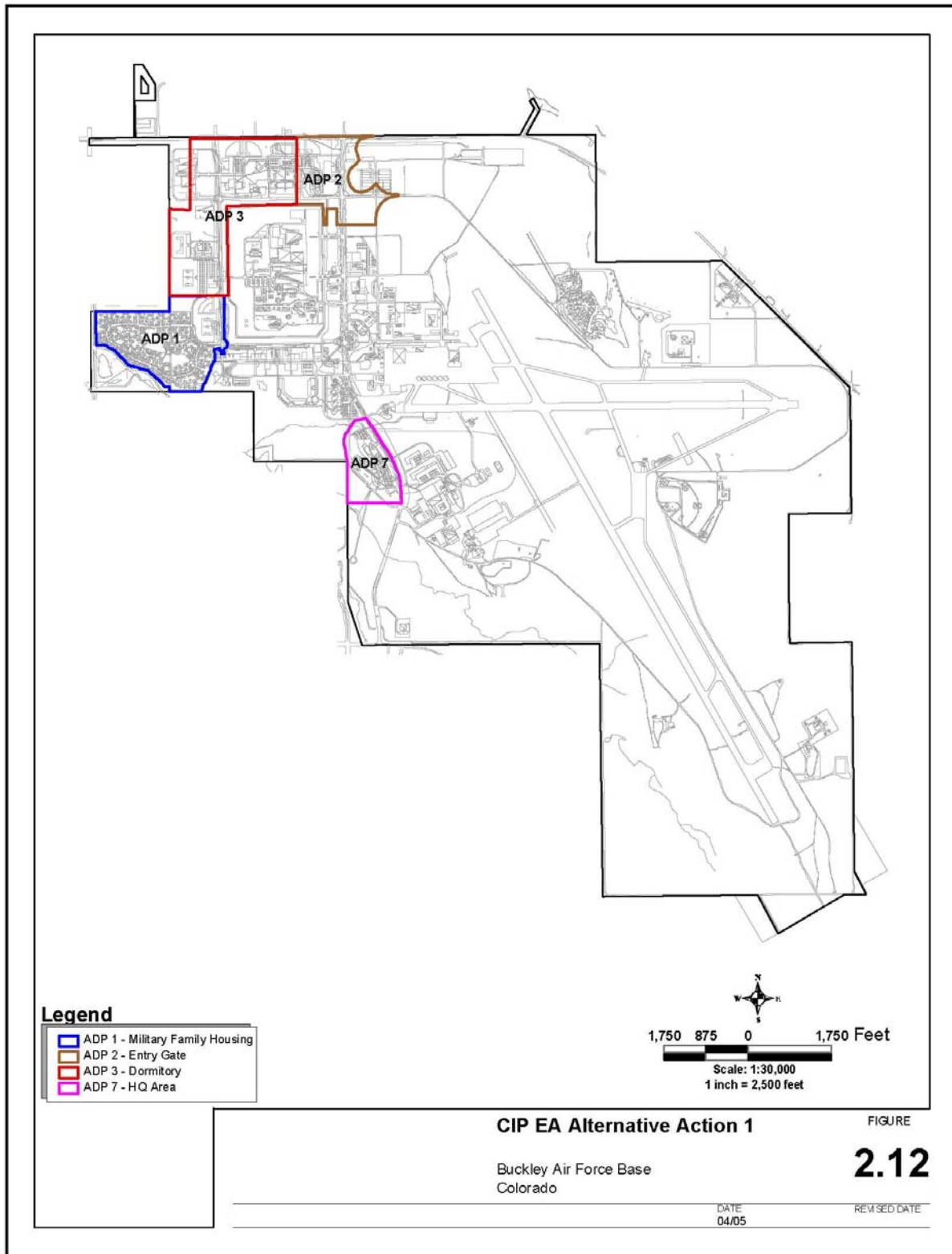
### **2.2.2 Alternative 1: Construct ADPs 1, 2, 3 and 7.**

Alternative 1 accelerates the construction program for the Leadership Development Center and headquarters buildings (within the Headquarters Area ADP) and the Privatized Housing, Dormitory, and Entry Gates ADPs (Figure 2.12). Details for the projects located within these four ADPs would be the same as described under the Proposed Action (see descriptions for these

ADPs in Table 2.1a). The USAF mission requirements from the realignment of BANGB to Buckley AFB have increased the need for expansion of the headquarters and Leadership Development Center. To provide on-base housing to key and essential personnel, permanent family housing and enlisted quarters are required to accommodate personnel to support this increase in mission requirements.

Alternative 1 provides a quality work environment but a limited range of support services and amenities to personnel living and working on the installation. The USAF is committed to provide safe and affordable housing to accompanied and unaccompanied military personnel assigned to Buckley AFB. In addition, USAF Policy Directive (AFPD) 32-60 states that “where the local civilian community cannot meet military needs, the USAF will provide suitable housing at installations”. The October 2000 Buckley AFB Housing Market Analysis (HMA) identified a requirement for 332 additional housing units (later expanded to 351 units for purposes of this EA) at the base (USAF, 2001), therefore establishing the need for construction of the MFH units. Community commercial, community service, and other support facilities needed to support the increased full-time military population and a substantial retired population left without support when Lowry AFB and Fitzsimons Army Medical Center (FAMC) were closed. The facilities required to serve these populations would be limited to the BX, Commissary, and the Army Air Force Exchange Service (AAFES) Gas Station.

In support of Buckley AFBs mission requirements, the Aircraft Operations and Maintenance and the Airfield/Aircraft Pavement ELUA CIP projects would also be constructed under this alternative. One or more proposed construction or demolition projects are scheduled to occur within these two ELUAs. Final individual facility sitings within each ELUA are subject to change under this Alternative. Approximately six demolitions are planned to occur as part of the CIP under Alternative 1. Table 2.20 lists the ADPs and ELUAs where the CIP Alternative 1 construction and demolition projects are located, and Figure 2.12 shows where these projects would be located.



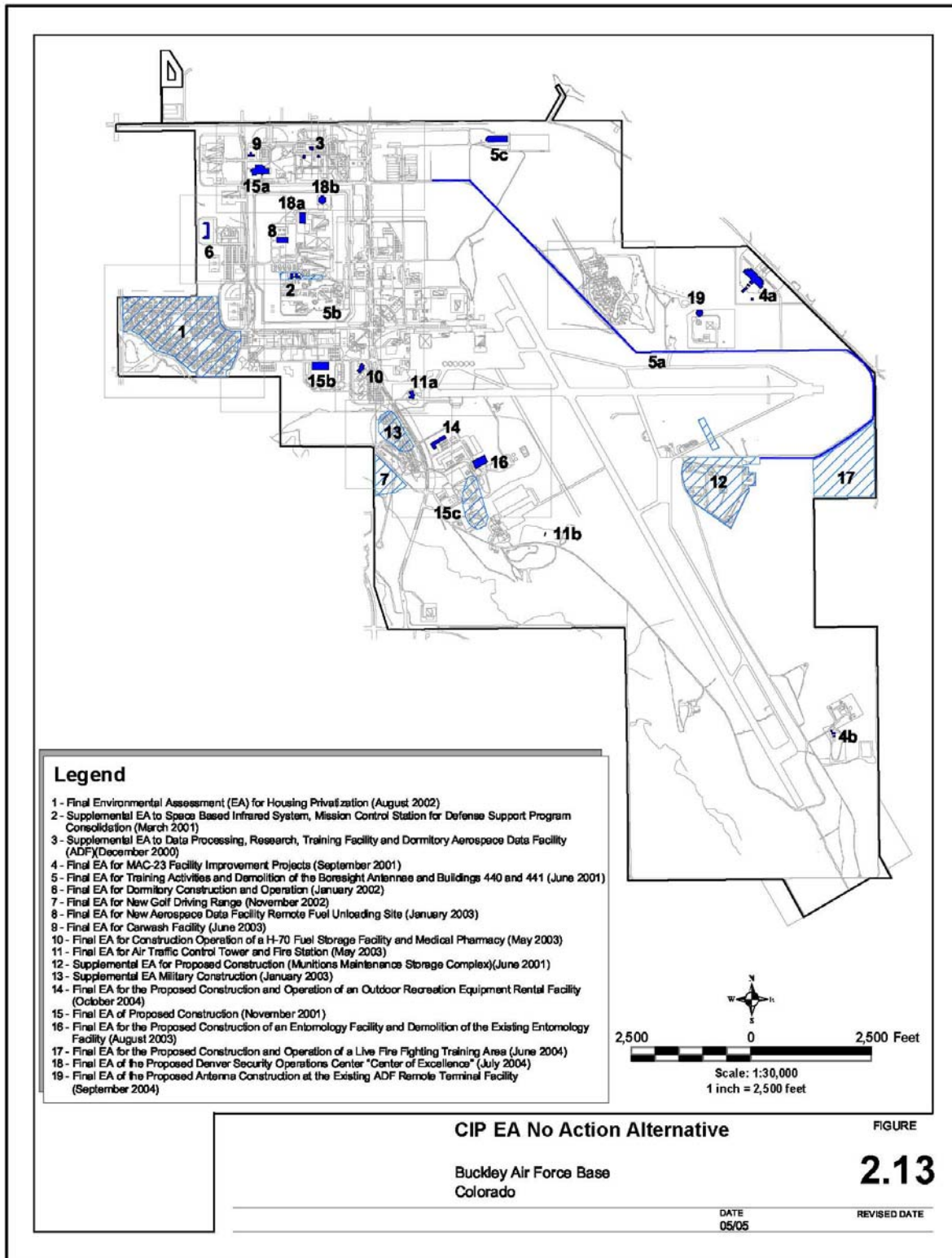
<b>Table 2.20: Alternative 1 ADPs and ELUAs Construction and Demolition Projects</b>	
<b>ADP/ELUA</b>	<b>Construction/Demolition Projects</b>
Privatized Housing ADP 1	<u>Construction:</u> All Privatized Housing ADP Projects <u>Demolition:</u> Jet Fuel Tanks And Refueling Operations
Entry Gates ADP 2	<u>Construction:</u> All Entry Gates ADP Projects <u>Demolition:</u> Baseball Field
Dormitory ADP 3 (North and South Sections)	<u>Construction:</u> All Dormitory ADP Projects <u>Demolition:</u> Winterpark Avenue Parking Lot Street West Of Dormitory #1
Aircraft Operations and Maintenance ELUA 2	<u>Construction:</u> All Aircraft Operations and Maintenance ELUA Projects <u>Demolition:</u> None
Airfield/Aircraft Pavement ELUA 3	<u>Construction:</u> All Airfield/Aircraft Pavement ELUA Projects <u>Demolition:</u> Building 1103 (Pump Station)
Headquarters Area ADP 7	<u>Construction:</u> Headquarters and Leadership Development Center Building Projects <u>Demolition:</u> Building 1011 (BCE Storage)

### 2.2.3 No Action Alternative: Construction of Facility Development Plan

Under the No Action Alternative, only the Facility Development Plan projects already authorized and currently under construction within ELUAs would be developed. Environmental consequences for these Facility Development Plan projects have already been or will be addressed under other EAs. These assessments are incorporated in this EA by reference, and therefore, projects that are either under construction or that would be constructed up to and during FY05 do not require further environmental analysis. The cumulative effects of these projects are evaluated for each resource topic under the No Action Alternative. These project locations are shown in Figure 2.13 and corresponding EAs and brief associated project descriptions are provided in Table 2.21a. Table 2.21b lists other EAs that are being prepared currently with this EA addressing CIP projects.



Description of the Proposed Action and Alternatives





<b>Table 2.21a: Environmental Assessments, Resulting In A Finding of No Significant Impact</b>		
<b>Title of Final EA</b>	<b>Projects</b>	<b>Date</b>
Supplemental EA Data Processing, Research, and Training Facility and Dormitory ADF at Buckley AFB	Construction of two picnic pavilions, a tennis court, and a basketball court.	December 2000
Supplemental EA Space Based Infrared System (SBIRS) Mission Control Station For Defense Support Program Consolidation United States Air Force Headquarters Space and Missile Systems Center Buckley AFB, Colorado	Construction, installation, and operation of two SBIRS radio frequency (RF) antennas at the Mission Control Station (MCS) site.	March 2001
Supplemental EA of Munitions Maintenance Storage Complex	Demolition of existing munitions facilities and construction of approximately 23,000 square feet of new munitions facilities to meet the evolving mission needs.	June 2001
Final EA for Training Activities and Demolition of the Boresight Antennae and Buildings 440 & 441 Buckley AFB	Identification and development of training areas. Construction of a jogging path; establishing a fenced, security forces impound lot; and demolition of the Boresite Antennae and Buildings 440 and 441.	June 2001
*Final EA of Proposed Construction Buckley AFB	Construction and operation of the following facilities: <ul style="list-style-type: none"> <li>• Fitness Center</li> <li>• Wing Headquarters Facility</li> <li>• Visitors Quarters</li> <li>• Temporary Lodging Facility</li> <li>• CE warehouse</li> </ul> Expansion of Buildings 1000, 1006, and 1007; and demolition of Buildings 25, 1011, 1611, 1620, and 1631.	November 2001
*Final EA for Cherry Creek Facility Buckley AFB	Expansion of existing radio tower facilities and the installation of new equipment and corresponding storage.	August 2001
Final EA for Dormitory Construction and Operation Buckley AFB	Construction and operation of a dormitory.	January 2002
Final EA for MAC-23 Facility Improvement Projects	Twenty construction improvement projects located at the Marine Air Squadron (MACS)-23 facilities including: <ul style="list-style-type: none"> <li>• Radomes</li> <li>• Parking lots, sidewalks, and concrete pads</li> <li>• Storage buildings</li> <li>• Canopies</li> <li>• Fencing</li> <li>• Gun shed</li> <li>• Removal of asphalt and concrete.</li> </ul>	August 2002

<b>Table 2.21a: Environmental Assessments, Resulting In A Finding of No Significant Impact</b>		
Final EA for Housing Privatization at Buckley AFB	Acquisition of a tract of land adjacent to Buckley AFB and the construction of 332 new housing units.	August 2002
Final EA for New Golf Driving Range at Buckley AFB	Construction of a golf driving range.	November 2002
Final EA for New Aerospace Data Facility Remote Fuel Unloading Site Buckley AFB	Construction and operation of a remote fuel unloading site.	January 2003
Supplemental EA for Buckley AFB Military Construction	Supplemental for the construction of a new Wing Headquarters Facility.	January 2003
Final Addendum to Supplemental EA Military Construction at Buckley AFB	Addendum for the construction of a new Wing Headquarters Facility.	May 2003
Final EA for the Proposed Construction of an H-70 Fuel Storage Facility and a Medical Pharmacy at Buckley AFB	Construction of an H-70 fuel storage facility. Demolition of the existing H-70 fuel storage facilities. Construction of a medical pharmacy.	May 2003
Final Buckley AFB Air Traffic Control Tower and Fire Station EA	Construction of a new air traffic control tower and an addition to the existing fire station. Demolition of the existing air traffic control tower and crash house.	May 2003
Final EA Carwash Facility at Buckley AFB	Construction and operation of a four-bay carwash facility.	June 2003
*Final EA for the Proposed Construction of an Entomology Facility and Demolition of the Existing Entomology Facility at Buckley AFB	Construction of a new entomology facility and demolition of the existing entomology facility (Building 306).	August 2003
Final EA for Phase III Infrastructure Upgrade and Expansion at Buckley AFB	Upgrades to the base's natural gas distribution system, electrical distribution systems, water and wastewater systems, and roadway and circulation system. Replace Building 39 with the construction of a new gas house and underground storage vault, and construction of a new road to improve traffic flow and safety conditions in the eastern portion of the base.	November 2003
Final EA of the Fielding of a CH-47 Chinook Platoon and Conversion to a General Support Aviation Battalion at Buckley AFB	Conversion of the existing Light Utility Battalion to a General Support Aviation Battalion and field seven CH-47 Chinook helicopters. Remove 31 UH-1 Huey helicopters and 10 UH-60 Black Hawk helicopters.	April 2004
Final EA for the Proposed Construction and Operation of a Live Fire Fighting Training Area at Buckley AFB	Construction and operation of a live fire fighting training area.	June 2004
*Final EA for Proposed Construction II Buckley AFB	Construction and operation of the following facilities:	June 2004

<b>Table 2.21a: Environmental Assessments, Resulting In A Finding of No Significant Impact</b>		
	<ul style="list-style-type: none"> <li>• Athletic Fields</li> <li>• Chapel</li> <li>• Child Development Center</li> <li>• ADAL to Clinic</li> <li>• Leadership Development Center</li> <li>• Munitions and Hazardous Materials Entrance Gate</li> <li>• New Visitors Center</li> </ul> Demolition of the following facilities: <ul style="list-style-type: none"> <li>• Building 19 (Camana Club)</li> <li>• Building 40 (Main Gate Visitors Center)</li> <li>• Building 41 (Main Gate Guard House)</li> <li>• Building 902 (Old Base Exchange)</li> <li>• Building 1620 (Radar Relay Building)</li> <li>• Building 1631 (Electrical Shop)</li> <li>• Building 1632 (Reserve Force Building).</li> </ul>	
*Final EA of the Proposed Denver Security Operations Center (DSOC) "Center of Excellence" Buckley AFB	Establishment and operation of DSOC.	July 2004
*Final EA of the Proposed Antenna Construction at the Existing ADF Remote Terminal Facility Buckley AFB	Construction and operation of an ADF antenna.	September 2004
*Final EA for Proposed Construction Projects for the 140th Wing, Colorado Air National Guard Buckley AFB	Construction and operation of the following facilities: <ul style="list-style-type: none"> <li>• Civil Engineering (CE) Complex</li> <li>• Alert Shelters and Alert Crew Quarters</li> <li>• High-Speed Taxiway and Warm-Up/Holding Pad</li> <li>• Fire Training Crash Rescue Facility</li> <li>• Weapons Load Training Complex</li> <li>• Weapons Release Complex</li> <li>• East Parking Apron</li> <li>• Approach Lighting for Runway 14</li> </ul>	September 2004
Final EA for the Proposed Construction and Operation of an Outdoor Recreation Equipment Rental Facility at Buckley AFB	Construction and operation of an outdoor recreation equipment rental facility.	October 2004

\* EAs not shown on Figure 2.13 due to off-base location or multiple project locations on-base.

<b>Table 2.21b: Environmental Assessments Prepared Concurrently with the CIP EA</b>	
<b>Proposed Title of EA</b>	<b>Projects</b>
Construction III Projects	Construct and operate: <ul style="list-style-type: none"> <li>• Small Arms Range</li> <li>• Logistics Readiness Complex</li> <li>• Consolidated Services Facility</li> <li>• Add/Alter Communications Center</li> </ul>
Proposed Construction and Operation of a Consolidated Fuels Facility and the Demolition of the Existing Fuel Farm	Construct, equip, and operate a consolidated fuels facility adjacent to the aircraft apron, northeast of the Civil Engineering Complex. Additionally, Buckley AFB would demolish the existing fuel tank farm, including Buildings 200, 202, 300, and 302, all associated equipment and piping, and all above-ground storage tanks (ASTs) containing jet propellant-8 (JP-8) fuel, liquid oxygen, liquid nitrogen, and glycol. Buckley AFB would also remove the fuels station located adjacent to Building 341, which contains two diesel ASTs and two gasoline ASTs.
Education Center	Construct and operate an Education Center
Security Forces	Construct and operate a Security Forces Operations Facility
Youth Center and RV Parking Lot Expansion Project	Construct and operate a Youth Center Expand an existing RV storage lot
Vehicle Maintenance Facility	Construct and Operate a 460 SW vehicle maintenance facility
Gates Projects	Modification, that includes construction and demolition, of the installation's entry gates.
Demolitions Projects	Demolish: <ul style="list-style-type: none"> <li>• Engine Test Pad</li> <li>• Bldg 902 (Thrift Shop)</li> <li>• Bldg 940 (Traffic Management)</li> <li>• Bldg 950 (Communications Facility)</li> </ul> Existing Firing Range (multiple structures)
Demolish Building 31	Demolish Building 31

Mission requirements for some 460th SW Commander Air Operations and Maintenance functions Buckley AFB would not be met under this Alternative because the Air Operations and Maintenance and Airfield/Aircraft Pavement projects would not be constructed. Although the existing facilities are adequate to meet current mission requirements, an expansion in flying missions or different aircraft would not be accommodated due to the uneven surface of the East Ramp and the layout of the airfield.

The No Action Alternative would support limited growth but would not maximize new mission, personnel and equipment opportunities. Although key mission requirements and

housing needs would be met, desirable and financially supportable Non-Appropriated Fund (NAF) facilities such as VQ/TLF, car wash, auto skills development center, outdoor recreation supply, golf course, or Williams Lake Recreation ADP would not be developed. Quality development standards and landscaping would be limited to main base entrances reducing the internal ambiance of the administrative structures, transportation and pedestrian corridors.

#### **2.2.4 Comparison of Anticipated Environmental Consequences From The Proposed, Alternative and No Action Alternatives**

Table 2.22 provides a comparison of the Proposed Action, Alternative Action 1 and No Action Alternatives as related potential environmental consequences. The table indicates if the environmental consequence would be adverse or beneficial and quantifies each consequence (as minor, moderate and major) that would be anticipated to occur in the short-term (during the phases of ground disturbance, demolition and construction) and long-term (occupation and operation of completed facilities and structures).

<b>Table 2.22 Comparison of Environmental Consequences</b>			
<b>Impact Topic</b>	<b>Proposed Action</b>	<b>Alternative Action 1</b>	<b>No Action Alternative</b>
Air Quality	Short-term – Moderate Adverse Impacts	Short-term – Moderate Adverse Impacts	Short-term – Minor Adverse Impacts
	Long-term – Moderate Adverse Impacts	Long-term – Moderate Adverse Impacts	Long-term – Minor Adverse Impacts
Geology and Topography	Not Applicable	Not Applicable	Not Applicable
	Not Applicable	Not Applicable	Not Applicable
Soils	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts
	Long-term – Minor Adverse Impacts	Long-term – Minor Adverse Impacts	Long-term – Minor Adverse Impacts
Hazardous Materials	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts
	Long-term – No Impacts	Long-term – No Impacts	Long-term – No Impacts

<b>Table 2.22 Comparison of Environmental Consequences</b>			
<b>Impact Topic</b>	<b>Proposed Action</b>	<b>Alternative Action 1</b>	<b>No Action Alternative</b>
Hazardous Wastes	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts
	Long-term – Minor Adverse Impacts	Long-term – Minor Adverse Impacts	Long-term – Minor Adverse Impacts
Historic Resources	Short-term-Negligible	Short-term-Negligible	Short-term-Negligible
	Long-term -Negligible	Long-term - Negligible	Long-term - Negligible
Land Use and Aesthetics	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts
	Long-term – Moderate Beneficial Impacts	Long-term – Moderate Beneficial Impacts	Long-term –Minor Beneficial Impacts
Environmental Justice	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts
	Long-term – Minor Adverse Impacts	Long-term – Minor Adverse Impacts	Long-term – Minor Adverse Impacts
Socioeconomics	Short-term – Moderate Beneficial Impacts	Short-term – Minor Beneficial Impacts	Short-term – Minor Beneficial Impacts
	Long-term – Moderate Beneficial Impacts	Long-term – Minor Beneficial Impacts	Long-term – Minor Beneficial Impacts
Cultural Resources	Not Applicable	Not Applicable	Not Applicable
	Not Applicable	Not Applicable	Not Applicable
Utilities	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts
	Long-term – Moderate Adverse Impacts	Long-term – Moderate Adverse Impacts	Long-term – Minor Adverse Impacts
Biological Resources	Short-term – Moderate Adverse Impacts	Short-term – Moderate Adverse Impacts	Short-term – Minor Adverse Impacts
	Long-term – Moderate Adverse Impacts	Long-term – Moderate Adverse Impacts	Long-term – Minor Adverse Impacts

<b>Table 2.22 Comparison of Environmental Consequences</b>			
<b>Impact Topic</b>	<b>Proposed Action</b>	<b>Alternative Action 1</b>	<b>No Action Alternative</b>
Traffic/ Transportation	Short-term – Moderate Adverse Impacts	Short-term – Moderate Adverse Impacts	Short-term – Minor Adverse Impacts
	Long-term – Moderate Adverse Impacts	Long-term – Moderate Adverse Impacts	Long-term – Minor Adverse Impacts
Water Resources	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts
	Long-term – Moderate Adverse Impacts	Long-term – Moderate Adverse Impacts	Long-term – Minor Adverse Impacts
Floodplains and Wetlands	Short-term-Negligible Beneficial and Adverse Impacts	Short-term-Negligible Adverse Impacts	Short-term-Negligible Adverse Impacts
	Long-term- Moderate Adverse Impacts	Long-term- Moderate Adverse Impacts	Long-term- Minor Adverse Impacts
Radon	Short-term – No Impacts	Short-term – No Impacts	Short-term – No Impacts
	Long-term – Minor Adverse Impacts	Long-term – Minor Adverse Impacts	Long-term – Minor Adverse Impacts
Lead-Based Paint	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts
	Long-term – No Impacts	Long-term – No Impacts	Long-term – No Impacts
Asbestos	Short-term – Moderate Adverse Impacts	Short-term – Moderate Adverse Impacts	Short-term – Minor Adverse Impacts
	Long-term – No Impacts	Long-term – No Impacts	Long-term – No Impacts
Noise	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts
	Long-term – Minor Adverse Impacts	Long-term – Minor Adverse Impacts	Long-term – Minor Adverse Impacts
Airspace	Not Applicable	Not Applicable	Not Applicable
	Not Applicable	Not Applicable	Not Applicable

<b>Table 2.22 Comparison of Environmental Consequences</b>			
<b>Impact Topic</b>	<b>Proposed Action</b>	<b>Alternative Action 1</b>	<b>No Action Alternative</b>
Safety and Pollution Prevention	Short-term – Moderate Adverse Impacts	Short-term – Minor Adverse Impacts	Short-term – Minor Adverse Impacts
	Long-term – Minor Beneficial Impacts	Long-term – Negligible Beneficial Impacts	Long-term – No Impacts
Environmental Restoration Sites	Not Applicable	Not Applicable	Not Applicable
	Not Applicable	Not Applicable	Not Applicable
PCBs	Not Applicable	Not Applicable	Not Applicable
	Not Applicable	Not Applicable	Not Applicable

Environmental consequences of the Proposed Action, Alternative Action 1 and No Action Alternatives are discussed in further detail in Section 4 of this EA.



## **SECTION 3**

### **AFFECTED ENVIRONMENT**

Buckley AFB is located on a 3,283-acre parcel located on the northeast side of the City of Aurora in Arapahoe County, Colorado. Aurora is the second largest city in the Denver Metropolitan Area (DMA) and is approximately five miles east of Denver (Buckley AFB 2002a). 460th SW became the host organization at Buckley AFB in October 2001 and supports many civilian and Department of Defense (DOD) tenants.

Construction and operation of the CIP ADPs and ELUAs involves the potential disturbance of approximately 636 acres of land within the 3,283 acre parcel, Buckley AFB. Resources that may be impacted and are analyzed in more detail in this EA are:

- Air Quality
- Soils
- Hazardous Materials
- Hazardous Wastes
- Historic Structural Resources
- Land Use and Aesthetics/Visual
- Environmental Justice
- Socioeconomics
- Utilities (water supply, wastewater treatment, solid waste, electricity and natural gas)
- Biological Resources
- Traffic/Transportation
- Water Resources
- Floodplains and Wetlands
- Radon
- Lead-based paint
- Asbestos
- Noise

- Safety
- Pollution Prevention

The region(s) of influence (ROI) related to the resources potentially impacted and analyzed in this EA are shown below on Table 3.1.

<b>Table 3.1: Environmental Resource Regions of Influence</b>	
<b>Environmental Resource</b>	<b>Region of Influence</b>
Air Quality	Denver Metropolitan Air Shed.
Soils	636-acre construction/demolition and operation sites.
Hazardous Materials	636-acre construction/demolition and operation sites.
Hazardous Wastes	636-acre construction/demolition and operation sites, and hazardous waste treatment storage and disposal facilities (TSDF).
Historic Structural Resources	Buckley AFB primarily within the ADP and ELUA areas of ground disturbance.
Land Use and Aesthetics/Visual	Primarily Buckley AFB and immediately surrounding (one-mile) area.
Environmental Justice	Areas within the City of Aurora adjacent to and surrounding Buckley AFB and areas adjacent to and surrounding major traffic arteries used to access the base.
Socioeconomics	Primarily Buckley AFB and Arapahoe County; the DMA is used for comparison with regional economic trends.
Utilities	636-acre construction/demolition and operation sites, electricity suppliers, natural gas suppliers, water suppliers, off-base wastewater treatment facilities, and local landfills.
Biological Resources	Buckley AFB and western Adams and Arapahoe Counties.
Traffic/Transportation	All on-base parking areas and roadways within Buckley AFB, major off-base corridors located near access points, including 6 <sup>th</sup> Avenue, Mississippi Avenue, Airport Boulevard, and State Highway 30.
Water Resources	South Platte River drainage basin, including East Toll Gate Creek, Sand Creek and Murphy Creek.
Floodplains and Wetlands	South Platte River drainage basin, including East Toll Gate Creek, Sand Creek and Murphy Creek.
Radon	636-acre construction/demolition and operation sites.
Lead-based paint	636-acre construction/demolition and operation sites.
Asbestos	636-acre construction/demolition and operation sites.
Noise	636-acre construction/demolition and operation sites, ELUA development areas, and adjacent sites.
Safety	Buckley AFB.
Pollution Prevention	Buckley AFB

### **3.1 RESOURCES NOT EXPECTED TO BE IMPACTED**

Resources not expected to be impacted by the Proposed Action, and therefore, not analyzed in this EA are described below. A brief explanation of why the resource is not expected to be impacted is also provided.

#### **3.1.1 Historic Archaeological and Cultural Resources**

The base has been broadly surveyed for historic resources, and no archaeological or prehistoric cultural resources are known or expected in the project areas. The construction and demolition areas have been previously disturbed and archaeological surveys indicate that it would be unlikely to find intact artifacts in the project areas. In the unlikely event that artifacts were discovered during construction or demolition, all activities would cease, and 460th SW Civil Engineer Squadron/Environmental Flight (CES/CEV) would be contacted. Since previously conducted surveys for archaeological and prehistoric cultural resources yielded no significant findings, historic structural resources will be the only cultural resource further evaluated under this EA.

#### **3.1.2 Geology and Topography**

Buckley AFB is located within the Denver Basin, a 60,000 square mile sedimentary rock depression east of the Front Range of the Rocky Mountains in east-central Colorado (Chronic and Halka 1980, Buckley AFB 2002d). The Denver Basin consists of several sedimentary formations containing shales, sandstones, and arkosic rocks up to approximately 300 million years old (Chronic and Halka 1980). These rocks are covered with a veneer of Holocene loess, eolian sand and colluvium, and Pleistocene alluviums consisting of unconsolidated materials including alluvial gravels, sands, and clays up to 3 million years old (Chase and McConaghy 1972).

No economically valuable minerals are anticipated in the ADPs. In addition, the regions of proposed construction and demolition are not within areas of known or suspected seismic instability.

The majority of the installation is developed on deep silt loam soils of the Fondis-Weld association. Soils at the proposed ADP construction sites are of this association and are generally

well-drained. Construction sites are relatively flat with little sloping and would require limited cut and fill excavation for installation of footers, foundations, and other flat features (sidewalks, parking lots, landscaped areas, etc.). There are some terrace escarpment soils along East Tollgate Creek where expandable soil types could pose a constraint to construction. For this reason only soils are to be evaluated under this EA.

### **3.1.3 Airspace**

The Proposed Action would not involve any change in current flying missions at Buckley AFB or any other airspace. According to the Metro Vision 2025 Interim Regional Transportation Plan, most of the air transport growth is to occur in the commercial service industry, the air cargo and corporate aviation sectors; therefore, effects on air space are not expected and are not analyzed in this EA.

### **3.1.4 Environmental Restoration Projects**

The USAF established the ERP to identify, characterize, and evaluate past disposal sites and remediate contamination on its installations as needed to control the migration of contaminants and potential hazards to human health and the environment in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements. A base-wide expanded Preliminary Assessment is currently being conducted, which may discover other environmental concerns not previously identified at the base. This assessment may potentially identify concerns within areas proposed for construction.

Related to previously identified ERP sites, Space Operations parking lots would be constructed over ERP site 10 at the northern boundary of the base as part of the Entry Gates ADP. ERP site 10 is a former warehouse area, where an interim remedial action is ongoing and for which a final remedy will be selected in the future. The grade of this area is relatively flat and since parking lot construction would require limited excavation, the project would not be expected to have any impact on ERP site 10. In addition, a parking lot is proposed within the Community Center ADP that would be constructed in the vicinity of ERP site 4, a former FTA-3 site. A soil removal action will be conducted at site 4 prior to construction of the parking lot.

The Headquarters Area ADP includes projects to construct the Leadership Development Center near ERP site 3, the former base dump, the building 1011 Area of Concern, and an

associated parking lot near ERP site 2, a former oil pit. Site 2 will receive a No Further Action designation once the Air Force signs the No Further Response Action Planned decision document and receives the anticipated regulatory concurrence. Caution may be required while excavating for foundations and footers and when digging utilities trenches for the Leadership Development Center, as these ground disturbance activities could potentially impact the ERP site 3 or the building 1011 Area of Concern. If ERP sites are encountered during construction, all activities should cease, and 460th CES/CEV would be contacted. Also, damage to the new facilities could occur if remediation activities are not conducted prior to construction. For these reasons it would be desirable to remediate the ERP sites prior to proceeding with construction in this area.

Demolition of Building 902 (Old Base Exchange) (within the Industrial ELUA) would be on the fringe of ERP site 9, which is a former underground storage tank (UST) burial site. Site 9 is currently being evaluated with a Site Inspection of both soil and groundwater. Although this demolition project would take place near ERP site 9, Building 902 consists of a slab-grade concrete foundation, without a basement, and therefore, the project would not be expected to have any impact on the ERP.

The degree of affect on or by ERP sites would depend on the relative dates of ERP remedial projects and Proposed Action projects. For example, it would be ill-advised to construct a parking lot in the community center ADP prior to remediation of the underlying contaminated soils, as required by federal law. A parking lot is scheduled to be built directly over ERP site 4, a former fire training area used in the early 1990's, which is contaminated with chlorinated solvents. The parking lot will be close to a proposed new child development center. ERP site 4 would be remediated prior to constructing this parking lot.

A review of the locations of ERP sites currently listed on Buckley AFB revealed that they would not affect or be affected by the remaining Proposed Action construction and demolition projects. Therefore, effects from the ERP will not be analyzed further in this document.

### **3.1.5 Polychlorinated Byphenyls (PCBs)**

The disposal of PCBs is regulated by 40 CFR Part 761, under the Toxic Substances Control Act (TSCA), which banned the manufacture and distribution of PCBs, with the exception of

PCBs used in enclosed systems. By federal definition, “PCB equipment” contains 500 parts per million (ppm) PCBs or greater; whereas “PCB-contaminated equipment” contains PCB concentrations equal to or greater than 50 ppm, but less than 500 ppm; and “PCB items” contain from 5 to 49 ppm PCBs. The electrical system at Buckley AFB is considered PCB-free (USAF, 2000). All transformers with PCB concentrations over 500 ppm have been removed, replaced, or retrofitted to below 50 ppm (USAF, 2000). The USAF has studied non-liquid PCBs and found that the concentration per volume would not exceed any disposal limits, therefore, the USAF would not conduct any non-liquid PCB testing prior to demolition. In addition, the Proposed Action does not involve any additional equipment or other items containing PCBs, therefore, environmental impacts from PCBs are not expected and are not further analyzed in this EA.

### **3.2 AIR QUALITY**

The ROI for air quality is the Denver Metropolitan Air Shed. The Clean Air Act (CAA) of 1970 directed the USEPA to develop, implement, and enforce environmental regulations to ensure cleaner air. To do so, the USEPA developed concentration-based standards called National Ambient Air Quality Standards (NAAQS). The USEPA established both primary and secondary NAAQS under the provisions of the CAA.

NAAQS are currently established for six air pollutants (known as “criteria air pollutants”) including CO, nitrogen dioxide (NO<sub>2</sub>), ozone, sulfur oxides (SO<sub>x</sub>, measured as SO<sub>2</sub>), lead (Pb), and PM<sub>10</sub>.

Air quality is measured by the concentration of various pollutants in the atmosphere, typically expressed in ppm or micrograms per cubic meter (µg/m<sup>3</sup>) (equivalent to parts per billion). The concentrations measured are compared to the NAAQS to assess compliance and determine attainment status of each Air Quality Control Region (AQCR).

<b>Table 3.2 National and State Ambient Air Quality Standards</b>				
<b>Criteria Pollutant</b>	<b>Averaging Time</b>	<b>Primary NAAQS<sup>(1),(3)(4)(5)</sup></b>	<b>Secondary NAAQS<sup>a(1)(3)(6)</sup></b>	<b>Colorado Standards<sup>(3)(4)</sup></b>
Carbon Monoxide	8-hour 1-hour	9 ppm (10,000 µg/m <sup>3</sup> ) 35 ppm (40,000 µg/m <sup>3</sup> )	No standard No standard	9 ppm (10,000 µg/m <sup>3</sup> ) 35 ppm (40,000 µg/m <sup>3</sup> )
Nitrogen Dioxide	Annual	0.0543 ppm (100 µg/m <sup>3</sup> )	No standard	0.0543 ppm (100 µg/m <sup>3</sup> )
Ozone	8-hour 1-hour	0.08 ppm (157 µg/m <sup>3</sup> ) 0.12 ppm (235 µg/m <sup>3</sup> )	No standard 0.12 ppm (235 µg/m <sup>3</sup> )	0.12 ppm (235 µg/m <sup>3</sup> )
Lead (Pb)	Quarterly	1.5 µg/m <sup>3</sup>	1.5 µg/m <sup>3</sup>	1.5 µg/m
PM <sub>10</sub> <sup>(2)</sup>	Annual 24-hour	50 µg/m <sup>3</sup> 150 µg/m <sup>3</sup>	No standard No standard	50 µg/m <sup>3</sup> 150 µg/m <sup>3</sup>
PM <sub>2.5</sub>	Annual <sup>(7)</sup> 24-hour <sup>(7)</sup>	15 µg/m <sup>3</sup> 65 µg/m <sup>3</sup>	No standard No standard	No standard No standard
Sulfur Oxides (measured as SO <sub>2</sub> )	Annual 24-hour 3-hour	0.03 ppm (80 µg/m <sup>3</sup> ) 0.14 ppm (365 µg/m <sup>3</sup> ) No standard	No standard No standard 0.50 ppm (1,300 µg/m <sup>3</sup> )	15 µg/m <sup>3</sup> 100 µg/m <sup>3</sup> 700 µg/m <sup>3</sup>

- (1) Primary standards define levels of air quality necessary to protect public health with an adequate margin of safety. Secondary standards define levels of air quality necessary to protect public welfare (i.e., soils, vegetation, property, and wildlife) from any known or anticipated adverse effects.
- (2) PM<sub>10</sub> Particles with aerodynamic diameters less than or equal to a nominal 10 micrometers.
- (3) The 8-hour primary and secondary ambient air quality standards are met at a monitoring site when the average of the annual fourth-highest daily maximum 8-hour average ozone concentration is less than or equal to 0.08ppm.
- (4) The NAAQS and Colorado standards are based on standard temperature and pressure of 25 degrees Celsius and 760 millimeters of mercury.
- (5) National Primary Standards: The levels of air quality necessary to protect the public health with an adequate margin of safety. Each state must attain the primary standards no later than three years after the state implementation plan is approved by the USEPA.
- (6) National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the state implementation plan is approved by the USEPA.
- (7) EPA has not promulgated final implementation rules for the 8-hour ozone standard and the PM<sub>2.5</sub> standards.

### 3.2.1 Meteorology

Buckley AFB and the surrounding area experience a semiarid climate characteristic of the high plains. Climatic conditions are typified by low humidity, abundant sunshine, low precipitation, and wide diurnal temperature fluctuations. The average annual temperature in 2004 was 52.0 degrees Fahrenheit (°F). The 2004 annual temperature ranged from -4 °F to 100.0

°F. The annual precipitation in 2004 was 15.24 inches, with approximately 46.6 inches of snowfall (120 WG Weather Flight, 2004). The prevailing winds within the local area are predominantly from the south, averaging 8.6 miles per hour (COANG, 1999).

### 3.2.2 Regional Air Quality

The CAA requires each state to promulgate a State Implementation Plan (SIP) that provides for implementation, attainment and maintenance of the NAAQS in each AQCR in the state. The fundamental method by which USEPA tracks air quality compliance is the designation of a particular AQCR as “attainment” or “non-attainment” with established NAAQS. If an AQCR achieves attainment with the NAAQS it seeks to maintain that status. The DMA, which includes a portion of Arapahoe County and Buckley AFB, is presently designated by the USEPA as an attainment/maintenance area for air pollutants of primary concern. Attainment/maintenance status for ozone emissions was achieved on 11 October 2001, for CO on 14 January 2002, and for PM<sub>10</sub> on 16 October 2002. However, ozone measurements during July 2003 exceeded the new 8-hour NAAQS at monitoring stations in the DMA. These circumstances have caused the area to defer its current attainment designation for ozone, as it is in danger of violating the standard.

### 3.2.3 Existing Conditions

Buckley AFB is in the Denver Metropolitan Intrastate AQCR 36. The stationary sources air emissions inventory for 2004 and the 2003 mobile sources air emissions inventory for Buckley AFB are presented in Table 3.3. The inventory data include mobile and stationary sources and provides totals for these two components. An air emissions inventory is an estimate of the total mass emission of pollutants generated from a source over a period of time.

<b>Table 3.3 Buckley AFB Mobile and Stationary Air Emissions Inventory<sup>(1)</sup></b>					
<b>Pollutant Emission Sources</b>	<b>CO (tpy)<sup>(2)</sup></b>	<b>VOC (tpy)<sup>(3)(5)</sup></b>	<b>SOx (tpy)</b>	<b>NOx (tpy)<sup>(4)(5)</sup></b>	<b>PM<sub>10</sub> (tpy)</b>
Buckley AFB 2003 Mobile Emissions <sup>(6)</sup>	204.5	56.9	2.1	40.6	5.0
Buckley AFB 2004 Point and Fugitive Stationary Source Emissions <sup>(7)</sup>	21.59	22.18	1.68	63.10	5.52
Total 2003 Mobile and 2004 Stationary Buckley AFB Emissions	226.09	79.08	3.78	103.7	10.52
AQCR 36 Emission Inventory <sup>(8)</sup>	678,170	167,900	69,350	112,785	32,156



<b>Table 3.3 Buckley AFB Mobile and Stationary Air Emissions Inventory<sup>(1)</sup></b>					
<b>Pollutant Emission Sources</b>	<b>CO (tpy)<sup>(2)</sup></b>	<b>VOC (tpy)<sup>(3)(5)</sup></b>	<b>SO<sub>x</sub> (tpy)</b>	<b>NO<sub>x</sub> (tpy)<sup>(4)(5)</sup></b>	<b>PM<sub>10</sub> (tpy)</b>
Conformity Rule De Minimus Threshold <sup>(9)</sup>	100	100	100	100	100
10 percent of AQCR 36 Emission Inventory (Significant Threshold Values)	67,817	16,790	6,935	11,279	2,316

(1) The Buckley AFB 2003 Air Emission Inventory did not assess lead or PM<sub>2.5</sub> emissions.

(2) tpy – tons per year.

(3) VOC - volatile organic compounds.

(4) NO<sub>x</sub> - nitrogen oxides.

(5) VOCs and NO<sub>x</sub> contribute to the formation of ground-level ozone.

(6) Source: URS Group, 2004. Mobile emission inventories are not conducted annually.

(7) Source: Golder Associates, 2005. Air Emissions Inventory, Buckley AFB CY 2004.

(8) Colorado Air Quality Control Commission (CAQCC), 2003 (CO-2006 Interim Year Inventory), 2001a, (VOC and NO<sub>x</sub> 2006 Inventory), and 2001 b (PM<sub>10</sub> and SO<sub>x</sub> 2005 Maintenance Inventory).

(9) 40 CFR 93.153(b) - These limits are applicable to non-attainment and maintenance areas, and therefore, apply to Buckley AFB.

Buckley AFB falls under CDPHE jurisdiction, which is tasked with issuing, renewing and enforcing the CAA Title V Air Operating Permit (Permit No. 950PAR118). The Buckley AFB Title V Air Operating Permit was originally issued August 28, 1997, while the current permit became effective on 1 July 2002, and will expire 30 June 2007 (CDPHE 2002 a and b). Minor permit modifications are currently pending EPA review (CDPHE 2005 a and b). The permit documents stationary sources of regulated emissions at Buckley AFB, including natural gas-fired boilers, gasoline-fired boilers, dual-fired boilers that primarily use natural gas but have fuel oil back-up, fuel oil generators, gasoline-fired arresting barrier engines, regulated aboveground storage tanks (ASTs), degreasing stations, and abrasive paint removal stations. Abrasive paint removal is performed in the Corrosion Control Hangar (Building 800) using hand-held sanders and closed-loop plastic media blasters. Boilers, generators, and arresting barrier engines burn fuels (natural gas, gasoline and fuel oil) and generate combustion emissions that can include CO, NO<sub>x</sub>, Pb, SO<sub>x</sub>, Total Suspended Particulates (TSP), PM<sub>10</sub>, and VOCs. Degreasing stations generate VOC emissions, and abrasive paint removal operations generate emissions of TSPs and PM<sub>10</sub>.

Primary fuel storage at the base currently includes two 210,000-gallon JP-8 ASTs and sixteen diesel ASTs ranging in size from 12,000 to 42,000 gallons. Additionally there are two gasoline

ASTs at 4,000- and 6,000-gallon capacity, two diesel ASTs with 4,000- and 6,000-gallon capacities, and three 12,000-gallon gasoline USTs. The fuel storage tanks are included in the Title V Air Operating Permit as emission sources of VOC created through evaporation, tank filling and breathing losses.

Mobile sources at Buckley AFB include on and off-road vehicles and equipment, aerospace ground equipment, and aircraft operations. Mobile sources are not considered under the CAA Title V operating permit or the Colorado operating permit program, but are considerable components of total base emissions.

Buckley AFB is a minor source for CO and VOCs (potential to emit less than 250 tons per year). The base is a synthetic minor source for NO<sub>x</sub> and SO<sub>2</sub> emissions under the Prevention of Significant Deterioration (PSD) provisions because the base accepted permit limits that establish the potential to emit for these emissions at less than 250 tons per year. For CO, PM<sub>10</sub>, and VOCs, Buckley AFB is a synthetic minor source under the Title V provisions because the base accepted permit limits that establish the potential to emit for these emissions at less than 100 tons per year. Buckley AFB is classified as a major source for NO<sub>x</sub> and SO<sub>2</sub> under Title V provisions. Future addition of new sources and modifications of existing sources at Buckley AFB resulting in a significant net emissions increase (See CDPHE Title 5 Colorado Code of Regulations [CCR] 1001-5, Regulation Number 3, Part A, Section I.B.37 and 58) for any pollutant as listed in the Regulation No. 3, Part A, Section I.B.58 or a modification which is major by itself would result in the application of the PSD or Non-attainment Area New Source Review (NANSR) requirements as appropriate (CDPHE, 2002a).

Buckley AFB has developed its own operational restrictions as an internal strategy for compliance. The 2004 inventory shows Buckley AFB to be well below permit limits for all pollutants (Golder Associates, 2005). On a cumulative basis, development of commercial establishments, such as dry cleaning operations, would result in emissions of VOCs and potentially Hazardous Air Pollutants (HAPs).

#### **3.2.4 Ozone Depleting Substances**

Buckley AFB currently has many air conditioning units and refrigerators containing ozone depleting substances (ODS). Contractors servicing this equipment must comply with all local,

state, and federal regulations related to installation, use, and repair of ODS-containing equipment.

### 3.3 SOILS

The ROI for soils is the approximately 636 acres scheduled for construction/demolition and operations associated with the Proposed Action. Buckley AFB is located within the Denver Basin, a 60,000 square mile sedimentary rock depression east of the Front Range of the Rocky Mountains in east-central Colorado (Chronic and Halka 1980, Buckley AFB 2002d). The Denver Basin was formed approximately 67 million years ago during a mountain-building event called the Laramide Orogeny. The basin is part of the Piedmont section of the Great Plains physiographic province that extends north and east into Wyoming, Nebraska, and Kansas (USAF, 2000).

The Natural Resources Conservation Service (NRCS) prepared descriptions and maps of the soil associations present at Buckley AFB (NRCS, 1971). Soil associations are landscapes exhibiting distinctive groupings of soil types. Fifteen soil types were identified on the base, most of which are classified as moderately to highly erodible. The soil types are listed on Table 3.4 and soil associations are shown on Figure 3.1. The major soil associations at Buckley AFB are classified as Fondis-Weld, Renohill-Buick-Little, and Alluvial-Nunn (Hunter/ESE, Inc., 1989). Other areas on Buckley AFB were identified as gravel pits, rock outcrop complex, terrace escarpments, and sandy alluvial land. The majority of the installation is developed on deep silt loam soils of the Fondis-Weld association. Soils at the CIP EA project sites are of this association and are well-drained.

<b>Table 3.4: Buckley AFB Soils Description</b>	
<b>Name</b>	<b>Description</b>
Bresser sandy loam, terrace, 0 to 3 percent slopes	Occurs along major drainage ways, runoff is slow
Bresser-Truckton sandy loams, 3 to 5 percent slopes	Occurs on slopes and ridgetops in native grass, susceptible to soil blowing
Buick loam, 3 to 5 percent slopes	Occurs in small, scattered areas on uplands in native grass, susceptible to soil blowing
Fondis silt loam, 1 to 3 percent slopes	Occurs on uplands, runoff is moderate, slightly to moderately susceptible to soil blowing and water erosion

**Table 3.4: Buckley AFB Soils Description**

Name	Description
Fondis silt loam, 3 to 5 percent slopes	Occurs on uplands, suited to cultivated crops, susceptible to soil blowing
Fondis-Colby silt loams, 3 to 5 percent slopes	Occurs along ridge tops, runoff is moderate, water holding capacity is high
Nunn loam, 0 to 3 percent	Occurs on terraces, runoff is slow, erosion is slight, water holding capacity is high
Nunn-Bresser-Ascalon complex, 0 to 3 percent slopes	Occurs on lower parts of slopes, well suited to cultivated crops, water holding capacity is moderate to high, erosion is slight to moderate
Renohill-Buick loams, 3 to 9 percent slopes	Occurs on uplands, not suited to cultivated crops, erosion is Severe
Renohill-Little-Thedalund complex, 9 to 30 percent slopes	Occurs on grassy hillsides, runoff is moderate to rapid, not suited to cultivated crops
Rock outcrop	Occurs near where soils have been stripped so that interbedded shale and sandstone are exposed at the surface, highly susceptible to soil blowing and erosion
Sandy alluvial land	Occurs as narrow areas along major drainageways next to stream channels, subject to yearly flooding
Terrace escarpments	Occur next to streams and drainageways, soil slipping and sloughing are common, water erosion is severe
Weld silt loam, 0 to 3 percent slopes	Occurs on uplands, water holding capacity is high, soil blowing can be severe
Weld-Deertrail silt loams, 0 to 3 percent slopes	Occurs on uplands, runoff is slight, moderately susceptible to soil blowing

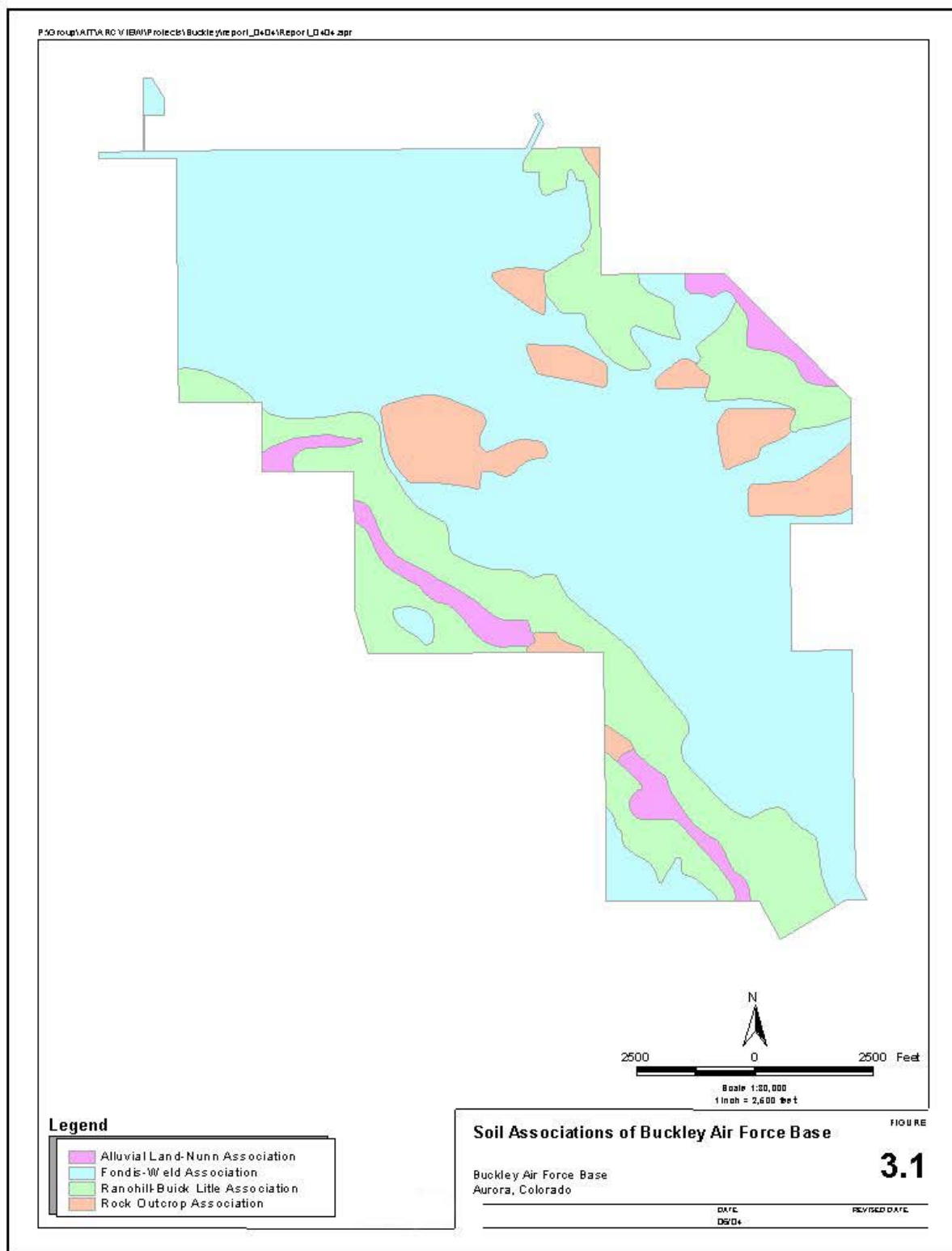
Some areas within the base could potentially be converted into and may support the growth of dry-land crops. However, several factors make the use of these lands for dry-land crop propagation less than desirable. The factors include the following:

- In the front-range of Colorado, 80 acres is considered the smallest size parcel that is economically feasible for dry-land cropping. On the base there is only one parcel that is close to that size, with the others being 20 acres or less.
- Since the largest parcel would be considered marginal as a soil of Statewide Importance and thus poses erosion hazards, proper farming operations would require installation of conservation practices to prevent surrounding wetlands from erosion effects. Measures that

would need to be taken to prevent erosion may include terracing; construction of field borders, filter strips, and/or riparian buffers; use of conservation tillage; and contour farming.

- Chemical application would be needed to control weeds (such as kochia [*Bassia seversian*] and Russian thistle [*Salsola australis*]) that could pose flight operation hazards. The use of chemicals to control weeds is undesirable in urban areas and could cause public relations issues with neighbors (U.S. Department of Agriculture [USDA], 2001).

For these reasons the potential to farm lands within the project areas is not feasible. There would be no effect on soils of Statewide Importance or to prime farmland soil resources resulting from the proposed action.



### **3.4 HAZARDOUS MATERIALS**

The ROI for HAZMATs is the approximately 636 acres scheduled for construction/demolition and operations associated with the Proposed Action. HAZMATs are those substances defined as hazardous by CERCLA (42 United States Code [U.S.C.] Sections 9601-9675), TSCA (15 U.S.C. Sections 2601-2671), and the Solid Waste Disposal Act, as amended by RCRA (42 U.S.C. Sections 6901-6992). In general, this includes substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare, or to the environment when released into the environment. In addition, HAZMATs are regulated by the Emergency Planning and Community Right to Know Act (EPCRA) (42 U.S.C. Sections 11001-110505). Transportation of HAZMATs is regulated by the U.S. Department of Transportation (DOT) and Colorado Department of Transportation (CDOT) regulations within 49 CFR.

The only HAZMATs located or stored at the Proposed Action construction or demolition sites include hydrazine, stored at the H-70 Fuel storage building; used oils and antifreeze used and stored at the vehicle maintenance building and auto skills development center; and fuels stored and used at the jet fuel storage tank and refueling operation area and the consolidated fuels facility.

### **3.5 HAZARDOUS WASTES**

The ROI for hazardous wastes is the approximately 636 acres scheduled for construction/demolition and operations associated with the Proposed Action. Hazardous wastes are those substances defined as hazardous by the Colorado Code of Regulations for Hazardous Wastes (Title 6 CCR 1007-3 Part 261). In general, this includes substances that, because of their characteristics, may present substantial danger to public health or to the environment. Hazardous waste from demolition, construction and operation activities must be managed in accordance with RCRA regulations (as adopted and implemented under corresponding regulations found at Title 6 CCR 1007-3) and the Buckley AFB Facilities Excellence Plan (dumpsters), Executive Orders (EOs) 13101 (recycling) and 13148 (landscape mulching), and the Affirmative Procurement Plan (purchasing recycling materials, including fly ash).

Hazardous wastes generated through Proposed CIP EA demolition projects could include lead-based paint (LBP) and asbestos wastes. In addition, hazardous waste may be generated through use and subsequent need for disposal of HAZMATs used during construction activities. Asbestos is managed as a special waste. Asbestos wastes are further discussed below in Sections 3.17, Asbestos and Section 4, Environmental Consequences. However, the potential quantity and the exact nature of the materials or wastes generated are unknown. Contractors would not be permitted to leave any HAZMATs on-base that could become wastes requiring disposal when projects are completed. All unused materials would be removed from the site by contractors at project completion. Although hazardous wastes would not be expected to be generated through operation of the proposed buildings and facilities, biohazardous wastes would continue to be generated at the Clinic. It is likely that the volume of biohazardous waste generation would increase with expansion of the Clinic, as the expansion would allow more patients to be treated.

Buckley AFB generated approximately 2,950 tons of non-hazardous waste in FY04 (Buckley AFB, 2004b). Of this waste volume, 1,531 tons were generated from construction and demolition activities. These values do not include 909 tons of non-hazardous solid waste and 1,105 tons of construction and demolition debris that were diverted and recycled in FY04. Buckley AFB also generated and disposed of approximately 12,051 lbs of hazardous waste in FY04 (Buckley AFB, 2004b). Additionally, approximately 6,808 lbs of waste were generated from clean-up activities, and 6,434 lbs of universal waste was disposed, reclaimed, or recycled. No biohazardous waste generation values are available.

### **3.6 HISTORIC STRUCTURAL RESOURCES**

The ROI for historic structural resources is Buckley AFB, primarily within ADP and ELUA ground disturbance areas. A comprehensive base-wide inventory and evaluation of buildings potentially eligible for the National Register was completed in 2004 and six structures (including Buildings 801 and 909; and radomes 402, 403, 404, and 405) were identified as potentially eligible. Buckley AFB will conduct any necessary State Historic Preservation Office (SHPO) consultation associated with potential historic resources within the ADPs.



### **3.7 VISUAL AESTHETICS**

The ROI for visual aesthetics is primarily Buckley AFB and the immediate surrounding (one-mile) area. The visual character of Buckley AFB is one of a military base. New housing developments include landscaped areas that provide some aesthetic value, but for the most part, the base is an industrial area that is dominated by the large radomes within the fenced area. Other buildings, particularly newly constructed buildings, are attractive and blend in with the plains landscape.

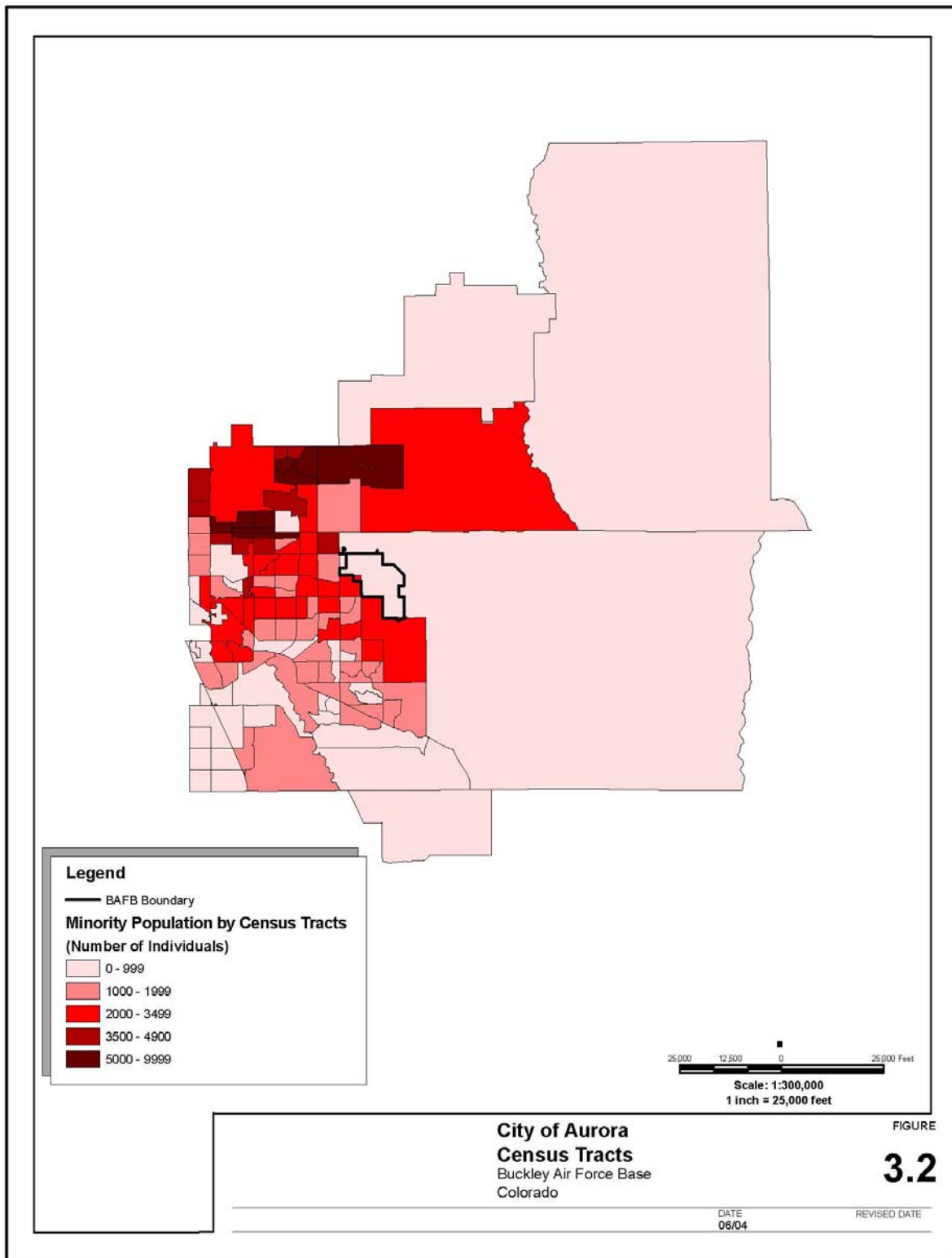
### **3.8 LAND USE**

The ROI for land use is primarily Buckley AFB and the immediate surrounding (one-mile) area. Land uses within Buckley AFB are generally divided into fourteen categories: administrative; aircraft operations and maintenance; airfield; airfield pavements; community commercial; community service; housing – accompanied; housing – unaccompanied; industrial; medical; mission operations and maintenance; open space; outdoor recreation; and water. The 460th SW prepared a GP to consolidate functions within the base for more efficient and compatible land use patterns (Buckley AFB, 2002a).

According to preliminary land use plans in the 2002 GP, Aspen Street provides a division for land uses east and west. To the west of Aspen Street, land uses would consist of the fenced missions, operations and maintenance, and industrial areas. To the east lies the air field. In this area a much higher percentage of the base is undeveloped. Approximately 1,200 acres are available for development which could accommodate twice the current base population (Buckley AFB 2002a).

Buckley AFB's Air Installation Compatible Use Zone (AICUZ) Program combined with analysis of the functional relationships between on-and off-base land uses address off-base land uses. The AICUZ Program strives to ensure compatible use of the lands surrounding the installation to reduce encroachment that may impede flight operations. These off-base development concerns include height of flight obstructions, noise levels generated by flight operations and zones of increased accident potential. Compatibility of off-base land use is conducted by partnering to promote planned growth that would support the needs of the City of Aurora, Arapahoe County, and Buckley AFB.

Consideration of these ADPs and the corresponding construction projects were developed over several years and the Proposed Action presented herein, represents the findings of the research and development conducted by the base. The locations and designs presented in the Proposed Action section comprise the environmentally and functionally superior set of facility designs.



### 3.9 SOCIOECONOMICS

The ROI for socioeconomics is primarily Buckley AFB and Arapahoe County. Areas adjacent to Buckley AFB are located within the DMA. Regional population and employment data from the DMA are used to evaluate and compare local changes with regional socioeconomic trends.

#### 3.9.1 Population

The urban and rural population of Arapahoe County increased by 96,456 persons or 24.6 percent between 1990 and 2000 to 487,967 people (United States Census Bureau [USCB] 2003).

The population profile for Buckley AFB is indicated in Table 3.5. Current active duty on and off-base residents of Buckley AFB represent less than 1 percent of the countywide population.

<b>Table 3.5: Buckley AFB Population Growth<sup>(1)</sup></b>		
<b>Category</b>	<b>2001<sup>(2)</sup></b>	<b>2010<sup>(3)</sup></b>
Active Duty	4,173	4,173
MFH	0	600
<b>Subtotal</b>	<b>4,173</b>	<b>4,773</b>
Guard/Reserve	5,890	5,890
Civilians	4,844	4,844
Contract/Private	2,561	2,561
<b>Subtotal</b>	<b>13,295</b>	<b>13,295</b>
Military Dependents Off-base	22,903 <sup>(4)</sup>	71,500 <sup>(4)</sup>
USAF Retirees	22,000 <sup>(4)</sup>	28,600 <sup>(4)</sup>
<b>Subtotal</b>	<b>44,903</b>	<b>100,100</b>
<b>Total</b>	<b>62,371</b>	<b>118,168</b>

- (1) Assumptions: Reserve forces, retirees and dependents living off-base would increase by 30% but the remaining population is expected to double.  
 (2) Source: Economic Impact Analysis, Buckley AFB, CO 30 September 2004.  
 (3) Source: GP Buckley AFB, CO November 2002.  
 (4) Source: GP Buckley AFB, CO 2005a

#### 3.9.2 Income and Employment

Median income (household, family, and non-family) increased by greater than 40 percent between 1990 and 2000 in Arapahoe County (USCB 2003). Per capita personal income

increased by approximately \$9,370 to \$28,147 (USCB 2003). Personal income in Arapahoe County between 1990 and 2000 increased 124 percent (Bureau of Economic Analysis [BEA] 2003). Nonfarm and farm personal income increased 124 percent to approximately \$21.6 billion, and 447 percent to approximately \$1.7 million, respectively, in 2000 (BEA 2003). The categories with the highest percent increase in earnings between 1990 and 2000 were state government (325 percent); transportation and public utilities (297 percent); finance, insurance, and real estate (264 percent); and agricultural services (211 percent) (BEA 2003). The mining industry lost earnings between 1990 and 2000 (-19.1 percent) (BEA 2003).

Total full-time and part-time employment increased 62 percent to 389,723 jobs in Arapahoe County between 1990 and 2000 (BEA 2003). The largest percentage employment gains between 1990 and 2000 were in Construction (163 percent); Transportation and Public Utilities (130 percent); State Government (123 percent); and Agricultural Services (108 percent) (BEA 2003). Job loss was reported for Mining (-41 percent) and Farms (-15 percent) (BEA 2003).

Average Metropolitan Denver Employment (MDE) figures for 2003 indicate a total of 1,134,489 jobs in the DMA (Table 3.6). Compared to the Average MDE in 2000, employment decreased by 30,864 jobs between 2000 and the 3<sup>rd</sup> Quarter of 2003 or 3 percent. The largest decreases occurred in the sectors of retail trade (-42 percent) and manufacturing (-22 percent). The largest increases in employment were the service, government, and finance, insurance, and real estate industries at +25 percent, +6 percent, and +8 percent respectively.

<b>Table 3.6: Metropolitan Denver Employment Trends by Category</b>				
<b>Industry</b>	<b>2000 Average MDE Employment</b>	<b>2003 3<sup>rd</sup> Quarter Average MDE Employment</b>	<b>Proportion of 2003 Jobs (%)</b>	<b>Change 2000-2003 (%)</b>
Services	351,896	438,665	39	+25
Retail Trade	204,633	119,561	11	-42
Government	149,953	158,590	14	+6
Transportation, Communication, and Public Utilities	99,095	99,958	9	+1
Manufacturing	90,485	70,351	6	-22
Finance, Insurance, and Real Estate	89,442	96,264	8	+8
Construction	87,748	81,492	7	-7
Wholesale Trade	74,137	62,339	5	-16
Agriculture, Forestry, and Fishing	12,215	2,266	0.5	-81
Mining	5,749	5,003	0.5	-13
<b>Totals</b>	<b>1,165,353</b>	<b>1,134,489</b>	<b>100</b>	<b>-0.03</b>

CDLE data for Arapahoe County was used to determine job numbers for the local community, including Buckley AFB (Table 3.7). Jobs in the local area for 2003 indicate a total of 261,702, representing 23 percent of jobs in the DMA (Table 3.7). The largest job sectors are in the retail trade (26 percent), finance, insurance, and real estate (at 36 percent) and Construction (25 percent).

<b>Table 3.7: Proportion of Local Employment as Compared to Average MDE 2003</b>			
<b>Industry</b>	<b>MDE Employment<sup>(1)</sup></b>	<b>Local Employment<sup>(2)</sup></b>	<b>Proportion of MDE (%)</b>
Services	438,665	99,077	23
Retail Trade	119,561	30,498	26
Government	158,590	30,790	19
Transportation, Communication, and Public Utilities	99,958	23,648	24
Manufacturing	70,351	8,668	12
Finance, Insurance, and Real Estate	96,264	34,390	36
Construction	81,492	19,986	25
Wholesale Trade	62,339	13,956	22
Agriculture, Forestry, and Fishing	2,266	130	6
Mining	5,003	559	11
<b>Totals</b>	<b>1,134,489</b>	<b>261,702</b>	<b>23</b>

(1) Represents average quarterly employment, 3<sup>rd</sup> Quarter 2003 for MDE.

(2) Represents average quarterly employment 3<sup>rd</sup> Quarter 2003 for Arapahoe County.

### 3.9.3 Housing

Housing for Buckley AFB consists of lease points rental units and unaccompanied personnel housing (dormitory). No military family housing currently exists on the installation. Lease point rental units are located and available throughout the City of Aurora.

Between 1990 and 2000, housing in Arapahoe County increased by 28,170 units or 16.7 percent (USCB 2003). Housing occupancy increased to 97 percent by 2000, a 5.3 percent increase over the occupancy rate in 1990 (USCB 2003). Median gross rent increased 58.7 percent between 1990 and 2000 in Arapahoe County to \$735 per month (USCB 2003). The median value of owner-occupied housing increased by \$79,200, or 85.6 percent between 1990 and 2000 in Arapahoe County (USCB 2003).

In the first half of 2003, the *Denver Metro Apartment Vacancy and Rent Survey* showed a 13 percent increase in the rental vacancy rate. At that time the DMA estimated a surplus of 15,000–20,000 existing rental units through 2005 as new rental units were constructed (U.S. Department of Housing and Urban Development [USDHUD] 2003). South Aurora/Arapahoe County along

with six other submarkets in southeastern DMA all had similar surpluses. Economic vacancy rates rose 1.7 percent from 23.1 percent the fourth quarter of 2003 to the current 25.7 percent (Rocky Mountain News 2004).

The increase rental vacancy rate resulted in rent reductions, with the average rent dropping to just below \$800 in the first quarter of 2003. The average rent increased to \$804.74 by the fourth quarter. As shown in Table 3.8 Arapahoe County's average rental rate is \$786.54, or within 2 percent of DMA's average rental rate. In the first half of 2004 the DMA rental vacancies decreased to 10.9 percent and the average rental rate has increased to \$809.14 (Denver Business Journal 2004).

<b>Table 3.8: Average Rents for DMA and Arapahoe County 4<sup>th</sup> Quarter 2003*</b>		
<b>Unit Type</b>	<b>DMA</b>	<b>Arapahoe</b>
Efficiency	\$531.69	\$520.96
1-Bedroom	\$706.23	\$704.75
2-Bedroom (average of 1&2 bathroom)	\$888.01	\$874.38
3-Bedroom	\$1,093.04	\$1,046.06
All	\$804.74	\$786.54

\* Source: Metro Denver Economic Development Corporation (MDED C), available at <http://metrodenveredc.org/dataCenter/QualityOfLive/Housing.icm>.

### 3.9.4 Community Redevelopment

The City of Aurora, the third largest city in the state, is one of the fastest-growing communities in Colorado. A significant amount of funding will continue to be spent on community redevelopment at former Lowry AFB and Fitzsimons Army Medical Center to enhance the community's economic development.

Urban renewal has resulted in the conversion of the 578-acre Fitzsimons Army Medical Center to a campus for the University of Colorado Health Sciences Center and a bioscience research and development park. Approximately 118 acres of land abutting this area will be used for high-density residential and commercial use resulting in jobs for more than 32,000 workers.



The Aurora Economic Development Council (AEDC) public/private partnership is dedicated to enhancing the economic strength of the City of Aurora by recruiting new primary employers, retaining existing primary employers and assisting current primary employers to expand in the city. AEDC have targeted national and regional headquarters, manufacturer's/distribution facilities, pro-tech office centers, biotechnology, space/defense, airport, ,and related businesses to the city.

### **3.10 UTILITIES**

The ROI for utilities is the approximately 636 acres scheduled for construction/demolition and operations associated with the Proposed Action, electricity suppliers, natural gas suppliers, water suppliers, off-base wastewater treatment facilities, and local landfills.

#### **3.10.1 Water supply**

Buckley AFB obtains potable water from the City of Aurora. The City of Aurora distributed a total of 13,580 million gallons per year (mgd) in 2003 (MACTEC, 2004a). Water use limitations can be imposed on the base by the City of Aurora under emergency drought water use restrictions. Water is distributed to facilities on-base for domestic use, process use, and fire protection. Buckley AFB used approximately 115.719 million gallons of water during FY04 (Buckley AFB, 2004b).

#### **3.10.2 Wastewater Treatment**

Buckley AFB generates both domestic and industrial wastewater. The industrial wastewater consists of water from oil/water separators (BANGB, 2000). The wastewater discharge from Buckley AFB is regulated under a Wastewater Contribution Permit that was issued by the Metro Wastewater Reclamation District. The permit was issued on February 1, 2003 and expires on January 31, 2008. The Metro Wastewater Reclamation District treatment plant was designed to meet population growth estimates through 2010, with a hydraulic capacity of 185 million gallons per day (mgd). No definitive wastewater discharge data is available at this time, however the annual average discharges metered at the discharge designated as MP001 was 1.4 mgd (or 511 million gallons per year) for calendar year 2003.

### **3.10.3 Solid Waste**

A private contractor manages solid waste collection and disposal services at Buckley AFB. Waste is collected from dumpsters located throughout the base and routinely transported to the Denver-Arapahoe Disposal Site, in Arapahoe County. The Denver-Arapahoe Disposal Site is owned by the City and County of Denver, but is operated under long-term contract by Waste Management. The permitted portion of the landfill occupies 2,680 acres with an estimated design life of 40 to 50 years. The landfill receives approximately 2,280,000 tons of solid waste per year (MACTEC, 2004b). Buckley AFB generated approximately 2,950 tons of non-hazardous waste in FY04, with 1,531 tons of this waste being construction and demolition derived wastes. These values equal approximately 0.13 and 0.07 percent of the total waste received by the Denver-Arapahoe Disposal Site landfill for non-hazardous and construction/demolition derived wastes, respectively.

### **3.10.4 Electricity**

Xcel Energy of Colorado (Xcel) provides electricity. The Xcel East Substation, located at the intersection of Colfax Avenue and I-225, provides electrical power to the base through 13.2 kilovolt (kV) overhead distribution lines. In FY04, the facilities at Buckley AFB used approximately 111,509,120 kilowatt-hours (kWh) of electricity (Buckley AFB, 2004b).

### **3.10.5 Natural Gas**

Natural gas is provided to Buckley AFB through a gas main beneath 6<sup>th</sup> Avenue. The regional natural gas system has a capacity of 130 billion cubic ft (ft<sup>3</sup>) (BANGB, 2000A). In FY04, Buckley AFB used approximately 152.0389 million ft<sup>3</sup> (mmft<sup>3</sup>) of natural gas (Buckley AFB, 2004b).

## **3.11 BIOLOGICAL RESOURCES**

The ROI for biological resources is Buckley AFB and western Adams and Arapahoe Counties.

### **3.11.1 Plant Communities**

Buckley AFB includes native and introduced plant communities, wetlands, and noxious weeds. Ground cover at developed sites is maintained as landscaped surfaces including lawns, xeriscaped and graveled areas, and planted shrubs and trees. The remainder of the ground cover

at the base consists of a mixture of native and alien mixed-grass prairie habitat, and in areas of consistently higher ground water table, native shrubs and trees. This section consists of descriptions of plant communities as well as invasive and noxious weeds at the sites of the Proposed Action.

Buckley AFB is located within the short-grass Steppe portion of the western Great Plains (Simms, Phillips and Risser, 2000). Native and introduced plants must cope with the semi-arid climate that provides little precipitation, drying winds and high evapotranspiration. The most successful plant adaptations to semi-arid circumstances is the grass form of reduced leaf surface area and low stature. Buckley AFB is situated on the eastern edge of the City of Aurora and much of the surrounding landscape consists of urbanizing mixed grass prairie, agricultural range, and cropland. A significant riparian habitat area exists 0.5 miles northeast of the installation along the Sand Creek floodplain.

The dominant plant communities at Buckley AFB are the introduced crested wheatgrass (*Agropyron cristatum*) community and the native mixed grass prairie community (Table 3.9).

<b>Table 3.9: Buckley Air Force Base Plant Communities<sup>(1)</sup></b>		
<b>Plant Community</b>	<b>Total Acres<sup>(2)</sup></b>	<b>Percent of Installation</b>
Bottomland Meadow	76	2.3
Cottonwood/Willow	28	0.9
Crested Wheatgrass	1,631	49.7
Mixed Grass Prairie	713	21.7
Ornamental Trees	19	0.6
Rabbitbrush	4	0.1
Weedy Forb	33	1.0
Yucca	4	0.1
Other Landscape Types*	775	23.6
<b>Total</b>	<b>3,283</b>	<b>100.0</b>

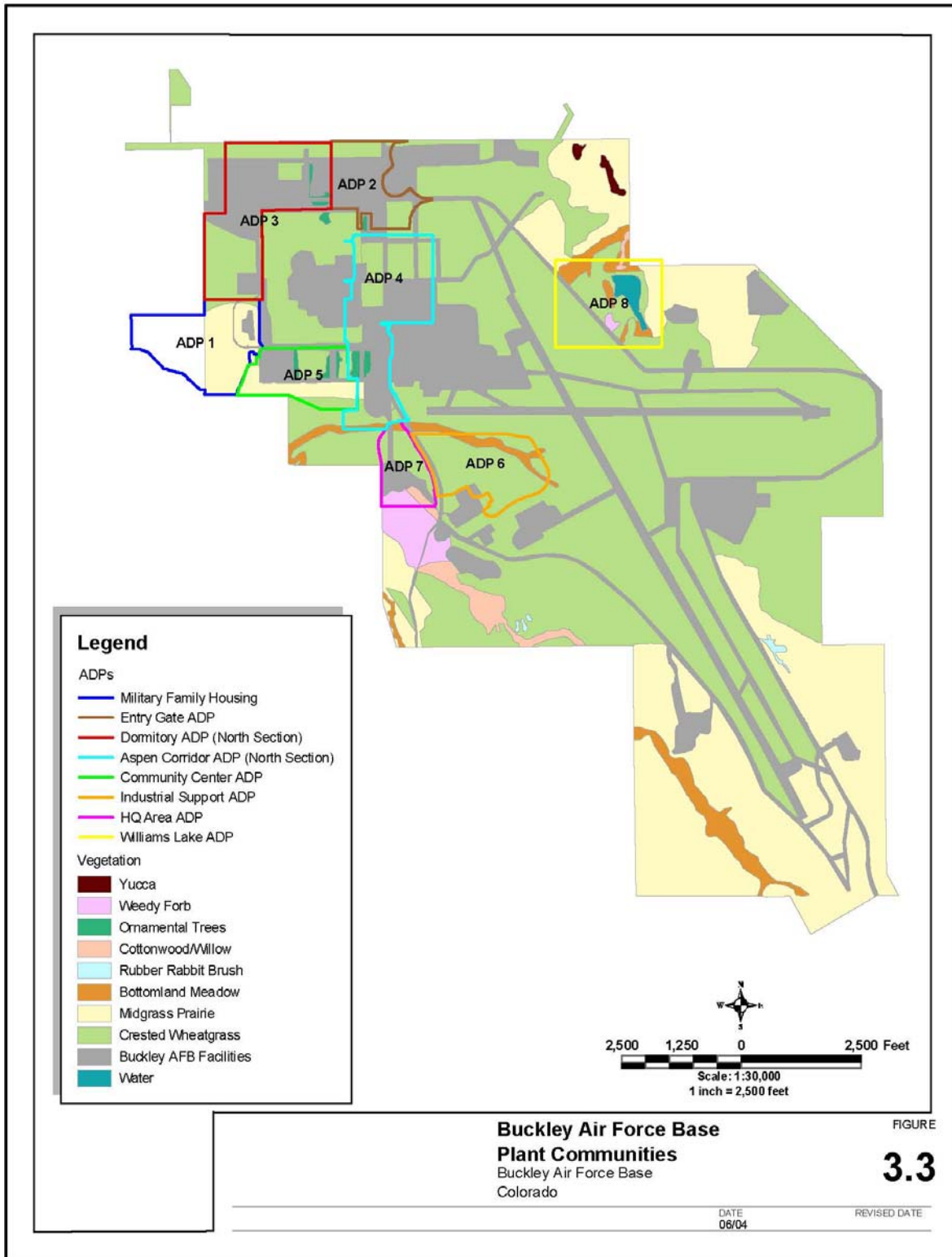
(1) Source: Buckley AFB 2002d.

(2) Includes Buckley AFB facilities (approximately 412 acres) and water (ranging from 8 to 10 acres).

Crested wheatgrass is an adventive species that occupies 49.7 percent (1,631 acres) of the installation. It is able to out-compete and exclude native wheatgrasses and other species.

Crested wheatgrass is an introduced Siberian grass known for its rapid, cool season growth strategy and drought tolerance. It has been used extensively in the mixed and short-grass prairie regions, including Colorado, as a soil stabilizer and a species of choice for grassland restoration projects. Crested wheatgrass stands are less diverse than native grasslands, although persistent in the face of climatic stress (Weber and Wittman, 2001; Simms, Phillips and Risser, 2000).

A smaller portion of the installation, approximately 713 acres, or 21.7 percent, located in the southern quarter, and northwest and northeast fringes, contain a mixed grass prairie community as shown in Figure 3.3. Several native grasses characteristic of the mixed grass prairie exist in these areas including: sideoats grama (*Boutoluea curtipendila*), blue grama (*Chondrosum gracile*), buffalo grass (*Buchloe dactyloides*), wild rye (*Elymus elymoides*), June grass (*Koeleria macrantha*), barley (*Hordeum jubatum*), needle and thread (*Hesperostipa comata*), green needle grass (*Nassella viridula*), and three awn (*Aristida purpurea*) (Colorado Natural Heritage Program, 2000).



Other plant communities at the installation include riparian stands of cottonwood/willow, including the trees: plains cottonwood (*Populus deltoides* var. *monilifera*) and the hybrid *Populus acuminata*, Russian olive (*Elaeagnus angustifolia*), coyote and peach-leaved willow (*Salix exigua* and *S. amygdaloides*), and Chinese elm (*Ulmus pumila*); herbaceous wetlands; isolated stands of yucca (*Yucca glauca*) and rabbitbrush (*Chrysothamnus* sp.); weedy forbs; planted ornamentals in proximity to facilities, and planted windbreaks along the installation perimeter. Figure 3.3 depicts the distribution of these plant communities at Buckley AFB. Table 3.9 lists the acreage and percentage of the installation occupied by each plant community.

### 3.11.2 Site-specific Plant Communities

The dominant plant communities occurring in the ADP and ELUA project areas are listed in Table 3.10. Figure 3.3 shows the outline of the project areas overlain on existing plant communities.

<b>Table 3.10 Plant Communities Observed or Characteristic Of ADPs and ELUs<sup>(1)(2)</sup></b>				
<b>ADPs/ELUAs</b>	<b>General Location</b>	<b>Development Footprint (acres)</b>	<b>Existing Plant Community/Habitat</b>	<b>Dominant Plant Species</b>
1. Privatized Housing	Northwest quadrant	71	Mixed Grass Prairie	Blue Grama, Needle and Thread, Wild Rye
2. Entry Gates	North central quadrant	54	Crested Wheatgrass Ornamental Trees	Crested Wheatgrass, Golden Aster ( <i>Chrysopsis</i> (Nutt.) Ell.), Chinese Elm, Ponderosa Pine ( <i>Pinus ponderosa</i> )
	Southern Quadrant (Mississippi Gate) <sup>(3)</sup>		Mixed Grass Prairie Ornamental trees	Russian thistle tumblegrass plainsbahia ponderosa pine common hackberry

<b>Table 3.10 Plant Communities Observed or Characteristic Of ADPs and ELUs<sup>(1)(2)</sup></b>				
<b>ADPs/ELUAs</b>	<b>General Location</b>	<b>Development Footprint (acres)</b>	<b>Existing Plant Community/Habitat</b>	<b>Dominant Plant Species</b>
3. Dormitory	Northwest quadrant	70	Crested Wheatgrass/ small Mixed Grass Prairie Component Ornamental Tree Component	Crested Wheatgrass, Blue Grama, Needle and Thread, Chinese Elm
4. Aspen Corridor	North central quadrant	44	Ornamental Trees and Shrubs/Crested Wheatgrass Mixed Grass Prairie	Green Ash ( <i>Fraxinus pennsylvanica</i> ), Chinese Elm, Ponderosa Pine, Crested Wheatgrass, Blue Grama
5. Community Center	Southern portion of the Northwest quadrant	41	Crested Wheatgrass Weedy Forbs Mixed Grass Prairie Ornamental Trees	Crested Wheatgrass, Western Wheatgrass ( <i>Pascopyrum smithi</i> ), Cheat Grass ( <i>Anisantha tectorum</i> ), Prairie Sunflower ( <i>Helianthus petiolaris</i> ), Ponderosa Pine, Chinese Elm
6. Industrial Support	West-central quadrant	61	Crested Wheatgrass	Crested Wheatgrass, Blue Grama, Plains

<b>Table 3.10 Plant Communities Observed or Characteristic Of ADPs and ELUs<sup>(1)(2)</sup></b>				
<b>ADPs/ELUAs</b>	<b>General Location</b>	<b>Development Footprint (acres)</b>	<b>Existing Plant Community/Habitat</b>	<b>Dominant Plant Species</b>
7. Headquarters Area	West-central quadrant	23	Crested Wheatgrass Cottonwood-Willow	Crested Wheatgrass, Blue Grama, Plains Saltgrass ( <i>Distichlis spicata</i> )
8. Williams Lake	Northeast quadrant	32	Crested Wheatgrass Weedy Forbs Cottonwood-Willow Mixed Grass Prairie	Crested Wheatgrass, thistles (including Canada thistle ( <i>Breca arvensis</i> ), musk thistle ( <i>Cardus nutans</i> ), and Scotch thistle ( <i>Onopordum acanthium</i> ), Plains Cottonwood, Coyote Willow
Open Space ELUA	Eastern Periphery	8	Crested Wheatgrass/Mixed Grass Prairie	Crested Wheatgrass/ Western Wheatgrass
Aircraft Operations and Maintenance ELUA	Central quadrant	23	Weedy Forbs and Grasses/Crested wheatgrass	Crested Wheatgrass/ Cheatgrass
Airfield/Aircraft Pavement ELUA	Central quadrant	148	Crested Wheatgrass	Crested Wheatgrass
Mission Operations and Maintenance ELUA	Northwest quadrant	43	Crested Wheatgrass	Crested Wheatgrass
Industrial ELUA	North Central Quadrant	3	Weedy Forbs	Bindweed ( <i>Calystegia</i> )
6 <sup>th</sup> Avenue ELUA	Northern boundary	15	Crested Wheatgrass/Noxious Weeds	Crested Wheatgrass, Kochia, Prairie Sunflower



<b>Table 3.10 Plant Communities Observed or Characteristic Of ADPs and ELUs<sup>(1)(2)</sup></b>				
<b>ADPs/ELUAs</b>	<b>General Location</b>	<b>Development Footprint (acres)</b>	<b>Existing Plant Community/Habitat</b>	<b>Dominant Plant Species</b>
Special Operations ELUA	One south and one central location	0	Mixed Grass Prairie	Western Wheatgrass, Needle and Thread
<b>Total</b>		636		

(1) Source: Buckley AFB, 2002a, b.

(2) Table 3.10 lists the estimated size of the construction envelope and the total acreage of each affected plant community that would be impacted or lost due to the Proposed Action construction projects.

(3) Source: Site visit conducted 15 Sep 2005 by Kara Altervater, U.S. Fish and Wildlife Service.

Of the eight ADPs and six ELUA project areas, 12 are located in weedy, crested wheatgrass prairie habitat, an area of approximately 367 acres; and two consist of mixed grass prairie, an estimated 64 acres. The remainder of the areas are 36 acres of ornamental trees and shrubs and 20 acres of weedy forbs.

### 3.11.3 Noxious Weeds

Noxious weeds are invasive, alien plant species that are very aggressive invaders, and are hard to decrease once they have established themselves. Many of the Colorado Front Range invasive noxious weeds are annuals which produce seed once, then die; and have adaptations that allow them to successfully colonize bare ground and soils with high mineral content. Buckley AFB has identified a number of noxious weeds on the base which are classified by the state of Colorado and Arapahoe County as noxious weeds. Air Force Instruction (AFI) 32-1053 Pest Management specifies that noxious weeds must be managed at USAF installations and the Colorado Weed Management Act requires counties to control noxious weeds (Colorado Department of Agriculture 2001). Invasive and noxious weed species occurring at Buckley AFB are listed in Table 3.11 and include, in decreasing order of abundance: thistles (several species, including Canada thistle, musk thistle, and Scotch thistle), Dalmatian toadflax (*Linaria dalmatica*), Dalmatian toadflax/thistle mixture, and leafy spurge (*Euphorbia usula*) (Buckley

AFB 2002d). Two other invasive weeds, kochia (*Bassia seversiana*) and Russian thistle (*Salsola australis*) are evident at several of the Proposed Action project locations as shown in Table 3.11.

<b>Table 3.11: Noxious Weeds Found at Buckley AFB*</b>		
<b>Scientific Name</b>	<b>Common Name</b>	<b>ADPs and ELUAs Where Observed</b>
<i>Acosta diffusa</i>	Diffuse knapweed	Not Reported
<i>Aegilops cylindrical</i>	Jointed goatgrass	Not Reported
<i>Anisantha tectorum</i>	Cheatgrass	Entry Gates ADP, Community Center ADP, Open Space ELUA
<i>Bassia seversiana</i>	Kochia	Community Center ADP, Open Space ELUAs
<i>Breea arvensis</i>	Canada thistle	Headquarters Area ADP, Entry Gates ADP, Community Center ADP, Dormitory ADP, Privatized Housing ADP, Williams Lake ADP, Open Space ELUA
<i>Carduus nutans</i>	Musk thistle	Headquarters Area ADP, Community Center ADP, Dormitory ADP, Privatized Housing ADP, Williams Lake ADP, Open Space ELUA
<i>Convolvulus arvensis</i>	Bindweed	Community Center ADP, Headquarters Area ADP, Open Space and Industrial ELUAs
<i>Descurania Sophia</i>	Tansy mustard	Headquarters AreaADP
<i>Euphorbia esula</i>	Leafy spurge	Williams Lake ADP
<i>Linaria dalmatica</i>	Dalmatian toadflax	Community Center ADP
<i>Linaria vulgaris</i>	Yellow toadflax	Not Reported
<i>Onopordum acanthium</i>	Scotch thistle	Headquarters AreaADP, Entry Gates ADP, Community Center ADP, Dormitory ADP, Privatized Housing ADP, Williams Lake ADP, Open Space ELUA
<i>Salsola australis</i>	Russian thistle	Not Reported
<i>Tamarisk ramosissima</i>	Saltcedar	Not Reported
<i>Verbascum thapsus</i>	Mullein	Not Reported

\* Source: Buckley AFB 2004c; 2002d.

### 3.11.4 General Wildlife

Buckley AFB provides habitat for a variety of small animals, including the desert cottontail (*Sylvilagus audubonii*), and black-tailed jackrabbit (*Lepus californicus*), and a few larger mammals, such as the coyote (*Canis latrans*), pronghorn (*Antilocapra americana*), and mule deer (*Odocoileus hemionus*). However, since a perimeter fence was erected in the early 1990s,

no pronghorn or mule deer reside within the Buckley AFB boundaries. Several species of mice, including the deer mouse (*Peromyscus maniculatus*), hispid pocket mouse (*Chaetodipus hispidus*) and western harvest mouse (*Reithrodontomys megalotis*) are likely the most abundant vertebrates at the installation, but the most conspicuous is a burrowing squirrel, the black-tailed prairie dog (*Cynomys ludovicianus*). In addition, several reptiles and amphibians, including the plains garter snake (*Thamnophis radix*), the prairie rattlesnake (*Crotalus viridis*), the bullsnake (*Pituophis catenifer*), the plains toad (*Bufo cognatus*), the Bullfrog (*Rana catesbiana*), the Northern Leopard Frog (*Rana pipiens*), and a variety of birds, including visiting and nesting raptors (hawks, eagles and owls), western kingbird (*Tyrannus verticalis*), western meadowlark (*Sturnella neglecta*), killdeer (*Charadrius vociferus*), Bullock's Oriole (*Icterus galbula*), and the grasshopper sparrow (*Ammodramus savannarum*) inhabit the base (Colorado Natural Heritage Program, 2000). Vertebrates known or potentially inhabiting Buckley AFB are listed in Table 3.12. Rare and/or protected species including the black-tailed prairie dog and the burrowing owl are discussed in Section 3.11.6, Threatened/Endangered Species and Species of Special Concern.

Table 3.12: Vertebrates Found Or Likely Occurring At Buckley AFB	
Scientific Name	Common Name
<b>Birds</b>	
<i>Aimophila cassinii</i>	Cassin's sparrow
<i>Ammodramus savannarum</i>	Grasshopper sparrow
<i>Aquila chrysaetos</i>	Golden eagle
<i>Ardea herodias</i>	Great Blue heron
<i>Athene cunicularia</i>	Burrowing owl
<i>Bubo virginianus</i>	Great horned owl
<i>Buteo jamaicensis</i>	Red-tailed hawk
<i>Buteo swainsoni</i>	Swainson's hawk
<i>Buteo regalis</i>	Ferruginous hawk
<i>Calamospiza melanocorys</i>	Lark bunting
<i>Carpodacus mexicanus</i>	House finch
<i>Cathres aura</i>	Turkey vulture
<i>Charadrius vociferous</i>	Killdeer
<i>Chordeiles minor</i>	Common nighthawk
<i>Colaptes auratus</i>	Northern flicker
<i>Columba livia</i>	Rock dove
<i>Delartes arcta</i>	Northern Flicker
<i>Dendroica petechia</i>	Yellow warbler
<i>Euphagus cyanocephalus</i>	Brewer's blackbird
<i>Falco sparverius</i>	American kestrel
<i>Haliaeetus leucocephalus</i>	Bald eagle

Table 3.12: Vertebrates Found Or Likely Occurring At Buckley AFB	
Scientific Name	Common Name
<i>Icterus galbula</i>	Bullock's oriole
<i>Turdus migratorius</i>	Robin
<i>Lanius ludovicianus</i>	Loggerhead shrike
<i>Mimus polyglottos</i>	Northern Mockingbird
<i>Molothrus ater</i>	Brown-headed cowbird
<i>Passer domesticus</i>	House sparrow
<i>Pica pica</i>	Black-billed Magpie
<i>Poocetes gramineus</i>	Vesper sparrow
<i>Sturnus vulgaris</i>	Starling
<i>Sturnella neglecta</i>	Western meadowlark
<i>Tyrannus tyrannus</i>	Eastern Kingbird
<i>Tyrannus verticalis</i>	Western Kingbird
<i>Zenaida macroura</i>	Mourning dove
Mammals	
<i>Canis latrans</i>	Coyote
<i>Cynomys ludovicianus</i>	Black-tailed prairie dog
<i>Chaetodipus hispidus</i>	Hispid pocket mouse
<i>Lepus californicus</i>	Black-tailed Jack rabbit
<i>Mephitis mephitis</i>	Striped skunk
<i>Microtus pennsylvanicus</i>	Meadow vole
<i>Mustela frenata</i>	Long-tailed weasel
<i>Peromyscus maniculatus</i>	Deer mouse
<i>Procyon lotor</i>	Raccoon
<i>Taxidea taxus</i>	Badger
<i>Vulpes vulpes</i>	Red fox
<i>Urocyon cinereoargenteus</i>	Gray fox
<i>Reithrodontomys megalotis</i>	Western harvest mouse
<i>Spermophilus tridecemlineatus</i>	Thirteen-lined ground squirrel
<i>Sylvilagus audubonii</i>	Desert cottontail
<i>Sylvilagus floridanus</i>	Eastern cottontail
Reptiles	
<i>Crotalus viridis</i>	Plains Rattlesnake
<i>Heterodon nasicus</i>	Western Hognose Snake
<i>Pituophis catenifer</i>	Bullsnake
<i>Sceloporus undulatus</i>	Northern Prairie Lizard
<i>Spea bombi frons</i>	Plains Spadefoot
<i>Thamnophis radix</i>	Plains Ribbon Snake
Amphibians	
<i>Bufo cognatus</i>	Plains Toad
<i>Rana catesbiana</i>	Bullfrog
<i>Rana pipiens</i>	Northern Leopard Frog

In addition to vertebrate populations, many invertebrates exist at Buckley AFB. Most conspicuous are pest species such as social wasps (yellow jackets), ants, and flies; and esthetic

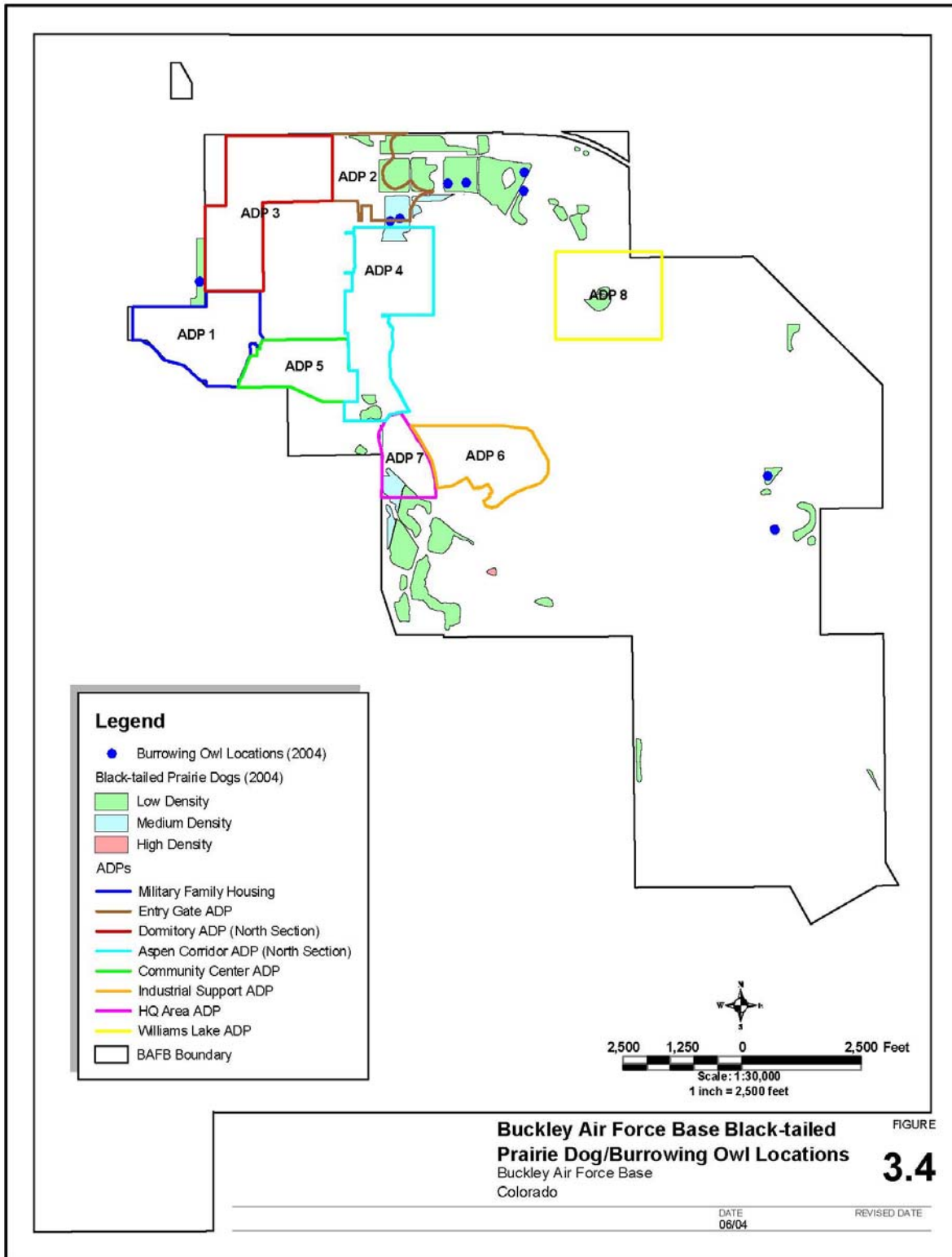
species such as butterflies. A few rare insects may occur at the installation, and are discussed in Section 3.11.6, Threatened/Endangered Species and Species of Special Concern.

Vertebrate diversity at Buckley AFB is likely somewhat lower in comparison with the surrounding landscape due to the boundary fence which limits the occurrence of medium sized mammalian predators such as bobcat, red fox, coyote and badger; eliminates the occurrence of ungulates (pronghorn, white-tailed deer and mule deer); and the prevalence of introduced grasses, particularly crested wheatgrass.

Several laws require management or protection of wildlife at USAF installations. Wildlife in Colorado is the property of the state. States, including Colorado, also have laws protecting rare species (see Section 3.11.6, Threatened/Endangered Species and Species of Special Concern). In addition, migratory birds, which include the majority of bird species in Colorado, are protected from unpermitted taking by the MBTA.

#### **3.11.5 Site-Specific Wildlife**

Site specific wildlife observations were made during two visits to the 15 project locations. Table 3.13 below lists wildlife observed, and/or characteristic of, each project location-based on observations and existing habitat. Of note is the presence of black-tailed prairie dogs at nine project areas (see figure 3.4).



The black-tailed prairie dog is abundant throughout Buckley AFB, and in addition, their presence at project sites creates habitat for the burrowing owl that is present during the non-winter months. Site-specific surveys for burrowing owls have not been conducted for the Proposed Action, however field surveys of selected black-tailed prairie dog wards at Buckley AFB have located this species at the following Proposed Action project areas:

- Dormitory ADP
- Privatized Housing ADP
- Airfield/Aircraft Pavement ELUA
- Special Operations ELUA (Buckley AFB 2003e).

<b>Table 3.13: Wildlife Observed or Characteristic Of ADPs and ELUs</b>				
<b>Project</b>	<b>General Location</b>	<b>Development Footprint (acres)</b>	<b>Characteristic (Expected) Wildlife</b>	<b>Observed Wildlife</b>
1. Privatized Housing	Northwest quadrant	71	Black-tailed prairie dog Burrowing owl Western Meadowlark Horned lark Several raptors Western fence lizard Plains garter snake Bull snake Prairie rattlesnake	Black-tailed Prairie Dog Burrowing Owl Western Meadowlark Western Kingbird
2. Entry Gates	North central quadrant	54	Black-billed Magpie Black-tailed Prairie Dog Starling American Crow Deer Mouse	Black-billed Magpie Black-tailed Prairie Dog Red-tailed Hawk
	Southern quadrant (Mississippi Gate)*		Black-tailed Prairie Dog Prairie songbirds Raptors	Black-tailed Prairie Dog Cottontail Rabbit

**Table 3.13: Wildlife Observed or Characteristic Of ADPs and ELUs**

<b>Project</b>	<b>General Location</b>	<b>Development Footprint (acres)</b>	<b>Characteristic (Expected) Wildlife</b>	<b>Observed Wildlife</b>
3. Dormitory	Northwest quadrant	70	Swainson's Hawk Black-tailed Prairie Dog Deer Mouse House Finch	Black-tailed Prairie Dog
4. Aspen Corridor	North central quadrant	44	Robin Deer Mouse Starling Kestrel	Black-tailed Prairie Dog Kestrel
5. Community Center	Southern portion of the Northwest quadrant	41	Black-tailed prairie dog Burrowing owl Western Meadowlark Horned lark House Finch Swainson's Hawk Red-tailed Hawk Plains garter snake Bull snake Prairie rattlesnake	Swainson's Hawk Black-tailed Prairie Dog Western Meadowlark
6. Industrial Support	West-central quadrant	61	Black-tailed Prairie Dog Kestrel Western Kingbird Swainson's Hawk	Black-tailed Prairie Dog Western Kingbird
7. 460th SW Headquarters	West-central quadrant	23	American Crow Raven Red-tailed Hawk Deer Mouse Black-billed Magpie Starling	Sharp-shinned Hawk Red-tailed Hawk Desert Cottontail
8. Williams Lake	Northeast quadrant	32	Black-tailed Prairie Dog Great Blue Heron Mallard Red-winged Blackbird Kingfisher Canada Goose Yellow Warbler	Not Visited



<b>Table 3.13: Wildlife Observed or Characteristic Of ADPs and ELUs</b>				
<b>Project</b>	<b>General Location</b>	<b>Development Footprint (acres)</b>	<b>Characteristic (Expected) Wildlife</b>	<b>Observed Wildlife</b>
Open Space ELUA	Eastern periphery	8	Western Kingbird Deer Mouse	
Aircraft Operations and Maintenance ELUA	Central quadrant	23	Same as above.	Same as above.
Airfield/Aircraft Pavement ELUA	Central quadrant	148	Black-tailed Prairie Dog Prairie Rattlesnake Burrowing Owl	
Mission Operations and Maintenance ELUA	Northwest quadrant	43	House Sparrow House Finch Robin Desert Cottontail Deer Mouse	Not Visited
Industrial ELUA	North Central Quadrant	3	Deer Mouse Black-billed Magpie Crow Desert Cottontail	Not Visited
6 <sup>th</sup> Avenue ELUA	Northern boundary	15	Coyote Black-tailed Prairie Dog Black-billed Magpie House Sparrow Deer Mouse	Coyote Black-tailed Prairie Dog Starling Plains Garter Snake
Special Operations ELUA	One south and one central location	0	Same as Mission Operations and Maintenance Black-tailed Prairie Dog Burrowing Owl	Not Visited
<b>Total</b>		636		

\* Source: Site visit conducted 15 Sep 2005 by Kara Altervater, U.S. Fish and Wildlife Service.

### 3.11.6 Threatened/Endangered Species and Species of Special Concern

Rare animals (including insects and other invertebrates) and plants are species whose numbers are small, declining, and/or threatened by changing habitat conditions or direct mortality. Often human activities are the main source of reduced numbers of a species, either through activities

that cause direct mortality or more often, by reducing and altering habitat to an extent that it does not support a viable species population. The ESA is the primary federal law protecting rare organisms and their habitat. Species listed under the ESA cannot be adversely affected by USAF activities without the agreement of the USFWS. Similarly, wildlife in Colorado belongs to, and is managed by the state of Colorado. The state of Colorado designates and protects from taking rare species that are listed under the Colorado Nongame, Endangered, or Threatened Species Conservation Act (CONETSCA). However, Colorado law does not prohibit habitat alteration or destruction. The ESA prohibits the USAF from taking actions that jeopardize the continued existence of any species (or subspecies) listed as a Threatened or Endangered species.

AFI 32-7064, Integrated Natural Resources Management, instructs USAF installations to protect and conserve federally listed Threatened/Endangered plants and animals and their habitats. AFI 32-7064 also suggests that, if practical, protection can be afforded to federal and state candidate species (USAF, 1997b). Several species that are protected or candidates for protection under the ESA and/or CONETSCA exist at Buckley AFB. These species are listed in Table 3.14 along with rare, but unprotected species that are known to occur, and species that have habitat and could occur, at Buckley AFB.

<b>Table 3.14: ESA and CONETSCA Species Occurring or Potentially Occurring At Buckley AFB<sup>(1)</sup></b>				
<b>Scientific Name</b>	<b>Common Name</b>	<b>Colorado Natural Heritage Program (CNHP) Ranking<sup>(2)</sup></b>	<b>Regulatory Status<sup>(3)</sup></b>	<b>Known To Exist at Project Sites</b>
<b>Amphibians</b>				
<i>Rana pipiens</i>	Northern Leopard Frog	Not Tracked	SC	Potentially exists at Williams Lake ADP
<b>Birds</b>				
<i>Athene cunicularia</i>	Burrowing owl	G4/S4B	ST	Known to exist at several project sites.
<i>Buteo regalis</i>	Ferruginous Hawk	G4/S3B,S4N	SC	Potentially a causal visitor.
<i>Charadrius melodus</i>	Piping Plover	G3/S1B	FT	No habitat, but affected by upstream water depletions.
<i>Charadrius montanus</i>	Mountain Plover	G2/S2B	SC	Not known on Installation.

**Table 3.14: ESA and CONETSCA Species Occurring or Potentially Occurring At Buckley AFB<sup>(1)</sup>**

Scientific Name	Common Name	Colorado Natural Heritage Program (CNHP) Ranking <sup>(2)</sup>	Regulatory Status <sup>(3)</sup>	Known To Exist at Project Sites
<i>Grus Americana</i>	Whooping Crane	G1/SNAN	FE, SE	No habitat, but affected by upstream water depletions.
<i>Haliaeetus leucocephalus</i>	Bald Eagle	G4/S1B,S3N	FT, ST	Could occur incidentally during Winter.
<i>Lanius ludovicianus</i>	Loggerhead Shrike	Not Tracked	SC	Occurs at installation incidentally.
<i>Sterna antillarum athalassos</i>	Interior Least Tern	G4/S1B	FE, SE	No habitat, but affected by upstream water depletions.
<i>Strix occidentalis lucida</i>	Mexican spotted owl	G3T3/S1B,SUN	FT, ST	No habitat.
<b>Insects</b>				
<i>Euphilopes rita coloradensis</i>	Colorado blue	G4T2T3/S2		Host plant (wild buckwheats) are available on installation. Unknown if host plants exist at project sites.
<i>Hesperia ottoe</i>	Ottoe skipper	G3G4/S2		No habitat.
<i>Ischura barberi</i>	Desert forktail	G4/SU		Unknown
<i>Sympertrum costiferum</i>	Saffron-bordered meadowfly	G5/S1		Unknown
<b>Fish</b>				
<i>Scaphirhynchus albus</i>	Pallid Strugeon	Not listed for Colorado.	FE	No habitat, but affected by upstream water depletions.
<b>Mammals</b>				
<i>Cynomys ludovicianus</i>	Black-tailed prairie dog	G4/S4	SC	Exists at 9 of 14 project areas.
<i>Mustela nigripes</i>	Black-footed ferret	G1/S1	E/SE	Does not exist at Buckley AFB.
<i>Perognathus fasciatus infaluteus</i>	Olive-backed pocket mouse	G5TNR, S2		Installation within Front Range distribution. Mixed grass stands is potential habitat.

**Table 3.14: ESA and CONETSCA Species Occurring or Potentially Occurring At Buckley AFB<sup>(1)</sup>**

Scientific Name	Common Name	Colorado Natural Heritage Program (CNHP) Ranking <sup>(2)</sup>	Regulatory Status <sup>(3)</sup>	Known To Exist at Project Sites
<i>Vulpes velox</i>	Swift fox	G3/S3	SC	Not known to exist on the installation.
<i>Zapus hudsonius preblei</i>	Preble's Meadow Jumping Mouse	G5T2/S1	FT/ST	USFWS concurrence that species not likely to occur on installation (USFWS 2003)
<b>Mollusks</b>				
<i>Anodonta grandis</i>	Giant Floater	G5/S1		Not likely to occur on installation. Does not occur at project sites.
<b>Plants</b>				
<i>Ambrosia linearis</i>	Plains ragweed	G2/S2		Not currently known from Arapahoe County.
<i>Asclepias uncialis</i>	Dwarf milkweed	G3T1T2/S1S2		Not known to occur on the installation.
<i>Eustoma russelianum</i>	Showy prairie gentian	G5/S3		Not known to occur on the installation.
<i>Gaura neomexicana</i> var. <i>coloradensis</i>	Colorado butterfly plant	G4T2/S1	FT	Not known to occur on the installation.
<i>Hypoxis hirsute</i>	Yellow stargrass	G5/S1		Generally not known from Arapahoe County.
<i>Ribes americanum</i>	American currant	G5/S1		Not known to exist at the installation.
<i>Spiranthes diluvialis</i>	Ute's ladies tresses	G2/S2	FT	Not known to occur on the installation.
<i>Viola pedatifida</i>	Prairie violet	G2/S2		Not known to occur on installation.

<b>Table 3.14: ESA and CONETSCA Species Occurring or Potentially Occurring At Buckley AFB<sup>(1)</sup></b>				
<b>Scientific Name</b>	<b>Common Name</b>	<b>Colorado Natural Heritage Program (CNHP) Ranking<sup>(2)</sup></b>	<b>Regulatory Status<sup>(3)</sup></b>	<b>Known To Exist at Project Sites</b>
<b>Plant Communities</b>				
<i>Populus deltoides</i> ssp. <i>Monilifera</i> – <i>Salix amygdaloides</i> / <i>Salix exigua</i>	Plains cottonwood riparian woodland	G2G3/S1		May occur at Williams Lake ADP.
<i>Heterostipa (Stipa) comata</i>	Mixed grass prairie	G2/S2		May occur in mixed grass areas

(1) Sources: CNHP, 2000; Buckley AFB, 2002b; The Colorado Rare Plant Technical Committee, 1999; USFWS, 2003.

(2) Colorado Natural Heritage Program Ranking Scheme as follows:

- S1 = critically imperiled in the state (five or fewer occurrences)
- S2 = imperiled in the state (6 to 20 occurrences)
- S3 = vulnerable throughout the state or found locally in a restricted range (21 to 100 occurrences)
- S4 = apparently secure in state, though may be rare in parts of range, especially periphery
- SH = historically known, but not verified for an extended period
- S#B = refers to breeding season rareness
- S#N = refers to non-breeding season rareness
- SAN = refers to non-breeding accidental occurrence in the state
- SZN = non-breeding season rareness where no consistent location for non-breeding or migratory populations can be discerned
- G= Global ranking; G#Q= uncertainty regarding global status and taxonomic status
- NA=Does not apply.

(3) FC = federal endangered species candidate; FE = federal endangered species; FP = federal proposed endangered species; FT = federal threatened species; SC = state species of concern; SE = state endangered species; ST = state threatened species.

Of the 29 species listed in Table 3.14 five species, the black-tailed prairie dog, the burrowing owl, the loggerhead shrike, the ferruginous hawk, and the Northern leopard frog, are known to reside at the installation. One species listed in Table 3.14, the bald eagle, is known to seasonally visit the installation but are not known to roost or nest at any of the project sites. Two plant communities, the Plains Cottonwood Riparian Woodland and the mixed grass prairie also exist at Proposed Action project areas. Although potential habitat for the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) occurs at Buckley AFB, field trapping in these areas did not locate the mouse and the USFWS has concurred that this species is not likely to occur at Buckley AFB (USFWS, 2002). In addition, the USFWS has determined that formal delisting of the Preble's meadow jumping mouse as a Threatened and/or Endangered species is warranted and began the process to remove the species from the list of Threatened and Endangered species in

January 2005. However, until a final determination is made in 2006, the Preble's meadow jumping mouse will continue to be protected under the Endangered Species Act. Similarly, the USFWS does not view occasional visits by wintering bald eagles as a source of jeopardy for this species (USFWS, 2003).

Of the six species mentioned above, the burrowing owl is the most wide-spread species of special concern residing at Buckley AFB, and is often co-located with the black-tailed prairie dog because of the burrowing owl's preference for roosting/nesting in abandoned prairie dog burrows. This migratory owl is protected as a Threatened state species, and is protected under the MBTA. The black-tailed prairie dog is a year-round resident at the installation, while the burrowing owl generally breeds and nests on the installation from March through October, then migrates south of Colorado for the winter. Plague coupled with recent control measures used to insure that black-tailed prairie dogs do not interfere with mission objectives have reduced colony acreage to approximately 296 acres (ERO Resources, 2004). The Buckley AFB 2004 burrowing owl survey identified 18 burrowing owl nests and 17 juveniles (ERO Resources, 2004). Black-tailed prairie dogs inhabited an average of 15 percent of the installation land surface during 2001-2003 (Buckley AFB, 2003e). A multi-county prairie dog survey conducted in 2000 showed that Buckley AFB was home to approximately 553 acres of black-tailed prairie dog colonies or 32 percent of the colony acreage located in the western half of Arapahoe County (CDOW/Colorado Grassland Species Working Group 2003; EDAW 2000).

The loggerhead shrike, and ferruginous hawk are predatory birds that inhabit the Great Plains. The loggerhead shrike is known to nest east and southeast of the installation (Carter 1999). Intermittent reports of these species at the installation suggest that either migrating individuals use Buckley AFB as a migratory stop-over, or occupy territories nearby, but are not known to roost or nest at any of the project sites.

The Northern leopard frog is a small amphibian listed as a state species of concern due to population declines. Once common except in the southeast corner of the state, this spotted green frog has suffered from competition with the more aggressive bull frog (*Rana catesbiana*) and water development (Hammerson 1999). Although populations have declined, it may occur in perennial waters such as Williams Lake at Buckley AFB. In addition there is potential habitat

for the olive-backed pocket mouse and host plants for the Colorado blue butterfly. However, the olive-backed pocket mouse has not been observed at Buckley AFB.

### **3.12 TRAFFIC/TRANSPORTATION**

The ROI for traffic/transportation is all on-base parking areas and roadways within Buckley AFB, major off-base corridors located near access points, including 6<sup>th</sup> Avenue, Mississippi Avenue, Airport Boulevard, and State Highway 30. This section identifies the existing transportation network and conditions in the vicinity of the project area. Buckley AFB is located in the DMA, along the Front Range of the Rocky Mountains. Major vehicle routes traverse through Denver including Interstate (I)-70, I-25, and I-76. Branching off I-70 to the west of the base is I-225, which runs north-south through the City of Aurora. Intersecting with I-225 in the City of Aurora and running east-west are two major arteries, 6<sup>th</sup> Avenue and Mississippi Avenue. These two roads serve as the main routes into Buckley AFB through the Main and Mississippi gates. In addition, Extension (E)-470 Toll Highway (E-470) provides an alternative beltway route around the eastern half of the DMA, and is located to the east of Buckley AFB. E-470 extends in a north to south direction in the vicinity of Buckley AFB, and is located approximately 0.75 miles from the eastern boundary of the base. These local and regional transportation systems provide future requirements for movement of Buckley AFB personnel and operations (Buckley AFB 2002a).

#### **3.12.1 Alternative Transportation Systems**

The Regional Transportation District (RTD) bus system provides daily service from the BX and Commissary (Building 1) to various locations throughout the DMA. There are currently no Light Rail Transit (LRT) systems that service the project areas. The proposed future expansion of the LRT would supplement transit service, and increase transit alternatives to downtown Denver, the Denver International Airport (DIA), and other regional transit options. Two future LRT stations are planned near the base. One would be located approximately four miles from the Entry Gates at 40<sup>th</sup> and Pena Boulevard, and the other would be located at the Aurora City Center approximately three miles from the Mississippi Gate.

Walking and bicycling are important elements of the transportation network. Both provide alternative forms of transportation and assists in the effort to reduce motorized traffic. There are

no designated on-street bicycle lanes within the project areas. There are a few pedestrian trails for employees or residents of Buckley AFB to use. An existing off-base bicycle path paralleling a portion of 6<sup>th</sup> Avenue does not connect to any other City of Aurora trails at the present time. Proposed future off-street bicycle lanes would be linked to this existing off-street bike path.

### **3.12.2 Installation Traffic**

Traffic on the installation uses a single primary street, Aspen Street which feeds traffic to two secondary streets that distribute traffic to the industrial and flight line areas. All other streets on the installation are classified as tertiary streets serving individual areas on the installation. Vehicular traffic accesses the installation through three entry control points, the Main, Telluride, and Mississippi Gates.

#### **3.12.2.1 Main and Telluride Gates**

##### **Off-Base Traffic**

There are two primary entrance gates to Buckley AFB along the northern boundary. The Main Gate is located to the south of a primary artery, 6<sup>th</sup> Avenue, which runs adjacent to the northern boundary of the base. The Main Gate is open 24 hours per day and provides access to Aspen Street on-base. The Main Gate sees approximately 655 peak morning hour (between 6:30 and 7:30 am) inbound vehicles (Buckley AFB, 2003d). The new Telluride Gate is also located to the south of 6<sup>th</sup> Avenue, east of the Main Gate, and is currently operated between 8:00 am and 8:00 pm Monday through Saturday and 8:00 am and 6:00 pm on Sundays (hours are subject to change). Since the Telluride Gate was recently completed no inbound vehicle data is available, but 200 to 250 peak morning hour inbound vehicles were estimated (Buckley AFB, 2003d). West of the Main and Telluride Gates, on 6<sup>th</sup> Avenue, the number of vehicles during the peak evening traffic hour (5:00 to 6:00 pm) is approximately 1,300 vehicles per hour. Traffic accessing the Main and Telluride Gates via E-470 would exit at exit number 19, 6<sup>th</sup> Avenue. Current traffic flow entering and exiting E-470 at exit 19 averages 300 vehicles per day (Parsons Brinckerhoff/Felsburg Holt and Ullevig [PBFH&U], 2002). East of the gates at the intersection of 6<sup>th</sup> Avenue and state Highway 30, the number of vehicles during the peak evening traffic hour is 400 vehicles per hour (USAF, 2000). This value includes traffic that would have exited E-470 at exit number 19.



### **On-Base Traffic**

At the Main Gate, 6<sup>th</sup> Avenue intersects with Aspen Street, the most heavily traveled road on-base. Aspen Street has average daily traffic ranging from 3,000 vehicles per day in the central base area to 500 vehicles per day in the less traveled areas of base (Buckley AFB, 2003d). The Telluride Gate provides access to Telluride Street on-base, and is designed primarily as a limited use gate for accessing the BX and Commissary. Traffic volumes at the Main Gate may have decreased in the recent past, due to the opening of the Telluride Gate.

#### **3.12.2.2 Mississippi Gate**

### **Off-Base Traffic**

The Mississippi Gate is located to the north of Mississippi Avenue, which runs adjacent to the southern boundary of the base. This gate provides access to Aspen Street at the southern boundary of the base and is open from 5:30 am to 7:30 pm. Approximately 780 peak morning hour inbound vehicles pass through the Mississippi Gate (Buckley AFB 2003d). Results of a study performed at the Mississippi Gate March 8 through 11, 2004 revealed that the daily average number of vehicles entering the base through the Mississippi Gate is 3,000 (averaging 195 vehicles per hour) (Aurora Police Department Traffic Unit, 2004). The Mississippi Gate receives all commercial vehicles (e.g., construction vehicles and delivery trucks). West of the Mississippi Gate, Mississippi Avenue is a four-lane divided boulevard with 700 vehicles per hour on the road during peak traffic hours (Buckley AFB, 2003d). Traffic accessing the Mississippi Gate via E-470 would exit at exit number 16, Jewell Avenue. Current traffic flow exiting E-470 at exit 16 averages 2,900 vehicles per day (PBFH&U, 2002).

### **On-Base Traffic**

At the Mississippi Gate, Mississippi intersects with Aspen Street. The on-base traffic impacts of the proposed CIP construction and demolition projects and operation of completed buildings and facilities will be assessed in Section 4, Environmental Consequences.

## **3.13 WATER RESOURCES**

The ROI for water resources is the South Platte River drainage basin, including East Toll Gate Creek, Sand Creek and Murphy Creek. Water resources include both surface and subsurface waters. Surface water includes all lakes, ponds, rivers, streams, impoundments, and wetlands within a defined area or watershed. Subsurface water, commonly referred to as groundwater,

typically is found in certain areas known as aquifers. Aquifers are areas of mostly high porosity soil where water can be stored within soil pore spaces. Groundwater usually is recharged during rain events and is withdrawn for domestic, agricultural, and industrial purposes. The CWA of 1972 is the primary federal law that protects the nation's waters. Its primary objective is to restore and maintain the integrity of the nation's waters.

Water resources analyzed in this section include the watershed and aquifers associated with Buckley AFB, which is located within the South Platte River drainage basin. East Toll Gate Creek, Sand Creek, and Murphy Creek drain the installation. Williams Lake, located in the northeast portion of the installation, is the largest body of surface water at Buckley AFB. The Proposed CIP EA project sites are relatively flat with little noticeable slope in any direction. However, several proposed sites are bounded by existing roadways. The roadways provide stormwater drainage through natural overland surface runoff, and man-made engineered drains, culverts and above and underground piping systems. Stormwater runoff from Buckley AFB drains to one of three streams adjacent to the base. Details of stormwater runoff and management are provided in subsequent sections pertaining to stormwater specifically.

### 3.13.1 Surface Water

Buckley AFB is located within the South Platte River drainage basin. Buckley AFB generally is divided into two watershed regions. The Eastern Watershed, on the eastern side of the base, contains three drainage basins (A, B and E). The Western Watershed, on the western side of the base, contains two drainage basins (C and D). The watersheds, drainage basins and corresponding pervious and impervious areas are shown below in Table 3.15.

<b>Table 3.15 Surface Water Drainage Watershed and Basin Information</b>				
<b>Watershed</b>	<b>Drainage Basin</b>	<b>Approximate Impervious Area (acres)</b>	<b>Approximate Pervious Area (acres)</b>	<b>Approximate Total Area (acres)</b>
Eastern	Basin A	44	339	383
	Basin B	42	542	584
	Basin E	14	323	337
Western	Basin C	170	1,139	1,309
	Basin D	142	372	514

<b>Table 3.15 Surface Water Drainage Watershed and Basin Information</b>				
<b>Watershed</b>	<b>Drainage Basin</b>	<b>Approximate Impervious Area (acres)</b>	<b>Approximate Pervious Area (acres)</b>	<b>Approximate Total Area (acres)</b>
<b>Totals</b>	<b>Not Applicable</b>	<b>412</b>	<b>2,860</b>	<b>3,272</b>

\* Source: Buckley AFB 2002d.

The proposed CIP project sites are located in each of the Watersheds. There are a total of approximately 3,272 acres of drainage area at Buckley AFB, of which 412 acres (12.6 percent) are impervious surface. The base has extensive natural and man-made surface drainage as well as underground storm drainage lines.

East Toll Gate Creek, Sand Creek, and Murphy Creek are intermittent streams in the vicinity of the base and flow predominately in the spring and summer. Sand Creek is perennial downstream from the base. The streams are tributaries to the South Platte River, which is located approximately 15 miles northwest of the base and is the primary surface water drainage system in the region. Williams Lake, the largest surface water source on Buckley AFB, is located in the northeast portion of the base and was created by damming a minor tributary to Murphy Creek. It occupies approximately 10 acres, but has a maximum surface area of 30 acres. It is an impoundment for runoff and well water, and is used strictly for fire-fighting and recreational purposes (COANG, 1999).

### **3.13.2 Stormwater**

Stormwater runoff from Buckley AFB drains into one of the three streams adjacent to the base. East Toll Gate Creek receives flow from the western side of the base, while Sand Creek and Murphy Creek receive flows from the eastern side of the base. Potential environmental stormwater consequences of the Proposed Action will be assessed in Section 4, Environmental Consequences.

The USEPA has jurisdiction over stormwater permitting at federal facilities in Colorado. Stormwater throughout Buckley AFB is regulated under the USEPA NPDES Stormwater Multi-Sector General Permit for Industrial Activities (COR05A13F, 12/1/2003). Buckley also obtained coverage under the NPDES General Permit for Storm Water Discharges from Federal Facility Small Municipal Separate Storm Sewer Systems (MS4) in Colorado on April 9, 2004. The MS4

permit requires Buckley AFB to review or coordinate all stormwater permitting activities and ensure controls are included in the design of all facilities. The NPDES permit considers all of Buckley AFB an industrial site, with the storage of HAZMATs occurring in all four drainage areas. Buckley AFB also implemented a stormwater pollution prevention plan (SWPPP) to insure that stormwater conveyance devices and structures are maintained and in good condition and that runoff is not contaminated by coming into contact with HAZMATs stored on-site. The SWPPP requires stormwater conveyance devices and structures, and HAZMAT storage areas to be properly designed, maintained, and inspected on a periodic basis.

### **3.13.3 Groundwater**

There are four major bedrock aquifers that underlie Buckley AFB within the Denver Basin. These are the Denver, Upper Arapahoe, Lower Arapahoe, and Laramie-Fox Hills aquifers. The aquifers are separated by beds of shale with low permeability and are located in zones of sandstones and siltstones.

There are alluvial aquifers in the area surrounding Buckley AFB. They are the result of alluvial deposition from erosion and are associated with East Toll Gate Creek and Sand Creek. Groundwater recharges to this aquifer through direct infiltration of precipitation and irrigation water (Buckley AFB, 2002d).

There are six groundwater wells on-base. In 1986, the base connected their system with the City of Aurora distribution system. Potable water is supplied to Buckley AFB by the City of Aurora.

## **3.14 FLOODPLAINS AND WETLANDS**

The ROI for floodplains and wetlands is the South Platte River drainage basin, including East Toll Gate Creek, Sand Creek and Murphy Creek.

### **3.14.1 Floodplains**

EO 11988, Floodplains Management, directs government agencies to avoid adverse effects and incompatible development in floodplains. The objective of the EO is to avoid, to the extent possible, the long- and short-term adverse impacts associated with occupancy and modification of floodplains. The EO applies to all federal agencies conducting activities and programs that may potentially affect floodplains. To comply with EO 11988, before taking any action, the

USAF must evaluate the impacts of specific proposals on the floodplain. If construction within the 100-year floodplain is unavoidable, the agencies must ensure the action conforms to applicable floodplain protection standards and that accepted flood-proofing and other flood protection measures are applied to the construction.

The Federal Emergency Management Agency (FEMA) has designated the East Tollgate Creek drainage to the southwest, and Sand Creek to the northwest as being within the 100-year floodplain. The Flood Insurance Rate Map (FIRM) shows the Sand and East Tollgate Creek floodplains are rated as Zones X and AE (Figure 3.5). Zone AE corresponds to a 1-percent annual chance of flood hazard. Zone X is an area outside the 1-percent annual chance for flooding and where the average stream flooding drainage area is less than 1 square mile (FEMA 1995).

<b>Table 3.16: Flood Zones within the 100-Year Floodplain</b>				
<b>Floodplain</b>	<b>Flood Zone X (acres)</b>		<b>Flood Zone AE (acres)</b>	
	<b>FEMA Study<sup>(1)</sup></b>	<b>Extrapolated<sup>(2)</sup></b>	<b>FEMA Study<sup>(1)</sup></b>	<b>Extrapolated<sup>(2)</sup></b>
East Toll Gate Creek	10.7	61.5	22.6	130.8
Sand Creek	3.7	0	16.4	0
Sub total	14.4	61.5	39	130.8
<b>Total</b>	<b>75.9</b>		<b>169.8</b>	
<b>Percent</b>	<b>31</b>		<b>69</b>	

(1) Acreage directly from Flood Insurance Rate Map (FEMA 1995); study limits terminated at the Buckley AFB west central boundary.

(3) Acreage is extrapolated from FEMA study area and projected onto the remaining 100-year floodplain limits provided by Buckley AFB.

Approximately 169.8 acres or 69 percent of the 100-year floodplain within Buckley AFB is within Zone AE. The remaining 75.9 acres or 31 percent is within Zone X.

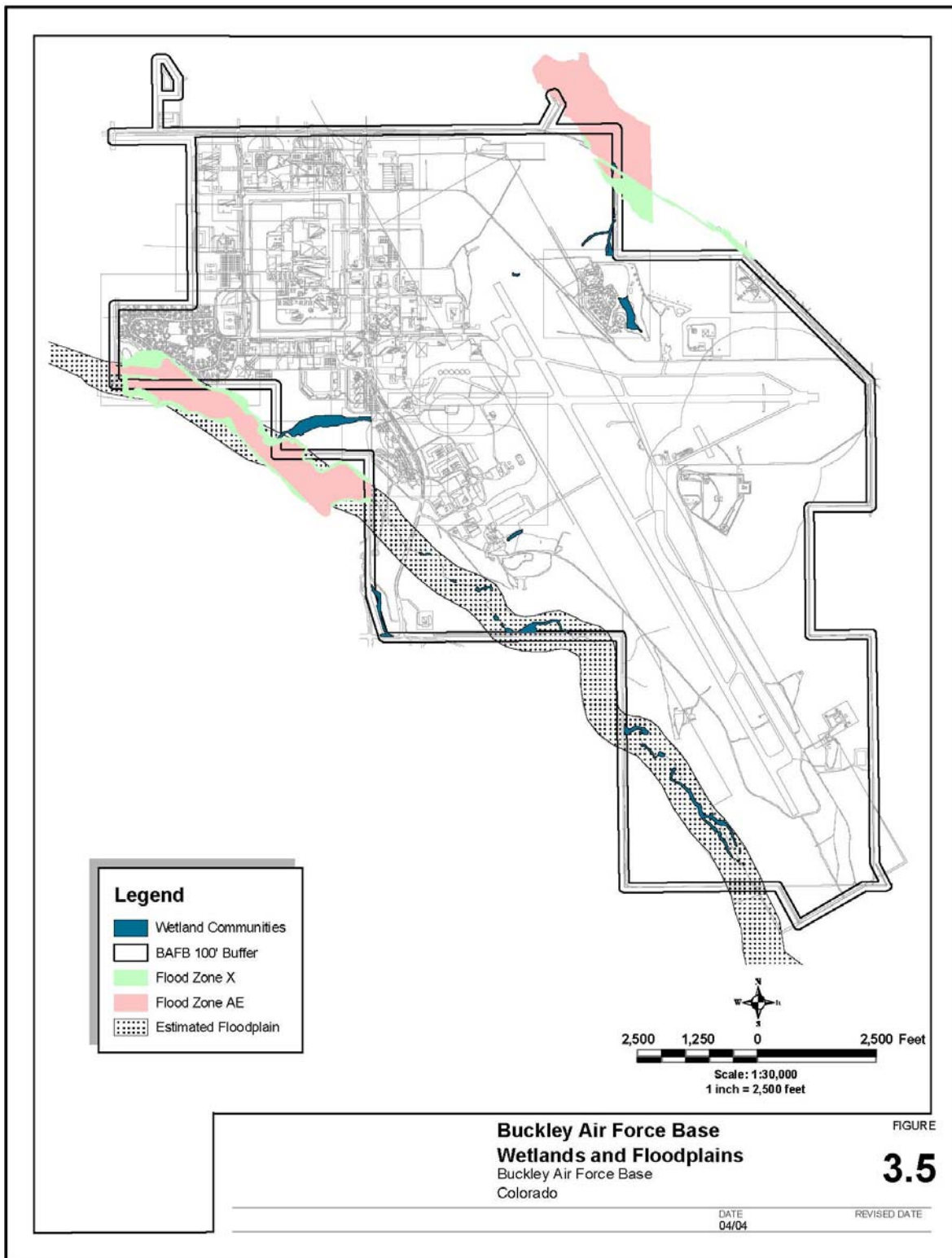
### 3.14.2 Wetlands

Six general areas containing 23 wetlands were identified on the installation as shown on the USFWS National Wetland Inventory Maps (NWI), (COANG 1999; Buckley AFB 2002d, USFWS 2001). Bottomland meadow or cottonwood willows are the dominant vegetation. Wetland areas are distributed within the East Tollgate Creek channel located along the south

western boundaries of the installation, and in the vicinity of Williams Lake. Most of these wetlands have not been delineated to determine their exact size but approximately 13 of the 23 are known to be jurisdictional and qualify for protection under Section 404 of the Clean Water Act. Additional field studies are required by the U.S. Army Corps of Engineers (USACE) if any disturbance is planned within these areas. Table 3.17 lists general wetlands located within the ADPs and ELUAs. Locations are shown on Figure 3.5.

<b>Table 3.17: General Wetland Areas Present at Buckley AFB*</b>		
<b>Watershed/Location</b>	<b>Wetland Type</b>	<b>Source</b>
East Tollgate/Southwest Base	Palustrine scrub/shrub	NWI
Columbia Creek/Southwest Base	Palustrine scrub/shrub	NWI
Williams Lake/East Base	Palustrine open water	NWI
North Williams Lake/East Base	Palustrine emergent	NWI
South Williams Lake/East Base	Palustrine emergent	NWI
Facility 1502, 1503/South-central Base	Palustrine emergent	NWI
Sand Creek Riparian Corridor/Northeast	Bottomland Meadow	Potential wetland/not field verified
East Tollgate Riparian Corridor/South and South-central	Cottonwood Willow/Bottomland Meadow	Potential wetland/not field verified

\* Source: USAF 2000.



### **3.15 RADON**

The ROI for radon is the approximately 636 acres scheduled for construction/demolition and operations associated with the Proposed Action. Radon is an odorless, tasteless radioactive gas. It is released by the breakdown of uranium-bearing deposits. Soil gas entering structures through basements, crawl spaces, cracks and openings in slab-on-grade floors, and below-grade walls and floors is the primary source of elevated radon levels. Radon moves into a building due to lower indoor air pressure resulting from heated air rising, wind, air used by fireplaces and wood stoves, or air vented to the outside by clothes dryers and exhaust fans in bathrooms, kitchens, or attics. TSCA Title III, "Indoor Radon Abatement," states indoor air in buildings of the United States should be as free of radon as the outside ambient air. Federal agencies are required to conduct studies on the extent of radon contamination in buildings they own. Overexposure to radon can cause lung cancer.

Building materials or fill soils used in construction can emit this gas. Radon is a naturally occurring gas in Colorado soils. The level at which the USEPA recommends consideration of radon reduction measures is 4 picocuries per liter (pCi/L). The USAF requires that buildings be tested for radon if the structure is occupied by personnel for more than 8 hours per day. EPA lists Buckley AFB in an area of highest potential for radon decay (greater than 4 pCi/L) (USEPA, 2003). Radon sampling was conducted between 1993 and 1997 at four buildings on-base. The results range from 0.2 to 6.9 pCi/L (COANG, 2000). All of the sampling results, except one, were below the USEPA standard of 4.0 pCi/L. Building 600 was the exception with radon levels of 6.9 pCi/L.

Depending on the location, type of construction, and usage of the Proposed CIP buildings, radon issues could result. Therefore radon levels may need to be considered and potential consequences will be further analyzed in Section 4, Environmental Consequences.

### **3.16 LEAD-BASED PAINT**

The ROI for LBP is the approximately 636 acres scheduled for construction/demolition and operations associated with the Proposed Action. The use of LBP declined after 1978 when the Consumer Product Safety Commission lowered the allowable lead content in paint to 0.06 percent by weight (trace amount) from its 1973 level of 0.5 percent by weight in a dry film of



newly applied paint. This change was made under the Consumer Safety Act of 1977, Public Law (PL) 101-608, as implemented by 16 CFR Part 1303. DOD implemented a ban of LBP use in 1978; however, it is possible that facilities painted prior to or during 1978 may contain LBP. The base engineer assumes that all structures constructed during or prior to 1985 potentially contain LBP.

Air Force Policy (Air Force Policy and Guidance on Lead-Based Paint in Facilities, 1993) ensures that LBP hazards are abated during building renovations or demolitions. There has not been an LBP survey conducted for Buckley AFB facilities. LBP abatement is accomplished in accordance with applicable federal, state, and local regulations prior to demolition or renovation activities to prevent any health hazards.

The Proposed Action involves demolition of buildings that could contain LBP, as some of the facilities may have been constructed and painted prior to or during 1978. In addition, the base engineer is required to assume that all structures constructed during or prior to 1985 potentially contain LBP. A LBP survey may need to be conducted in buildings scheduled for demolition. The survey would involve sampling of painted surfaces and sample analysis to determine if LBP are present. If the presence of LBP is confirmed the associated hazards would be abated in accordance with applicable federal, state, and local regulations prior to the demolition of the buildings. LBP is therefore analyzed further in this EA in Section 4.

### **3.17 ASBESTOS**

The ROI for asbestos is the approximately 636 acres scheduled for construction/demolition and operations associated with the Proposed Action. Asbestos containing material (ACM) is regulated by the USEPA and Occupational Safety and Health Association (OSHA). Emissions of asbestos fibers into the ambient air are regulated in accordance with Section 112 of the CAA, which established the National Emissions Standards for Hazardous Air Pollutants (NESHAP). NESHAP also requires that the EPA or the state (if the state has been delegated authority under NESHAP) be notified before a building is demolished, and/or before renovations impacting ACM begin. In Colorado, the CDPHE is the delegated authority under NESHAP. Unless the architect of a structure certifies that the facility contains no ACM, Buckley AFB will inspect buildings located on the base using Colorado-accredited building inspectors. A revised base-

wide survey is currently under way, and sampling has been conducted on many facilities. Buckley AFB will notify any contractor, vendor, or other outside parties about the presence of ACM prior to any work that could disturb the ACM, and ensure that they are qualified to conduct work that may involve ACM disturbance. In addition, soil samples were taken from eleven proposed FY04 through 07 construction sites and analyzed for asbestos in January 2003. The results were negative for asbestos.

Infrastructure, including asbestos wrapped pipes, was left in place during some 1950's-1960's era demolition projects. Therefore, the potential exists for either finding asbestos wrapped pipes or asbestos contaminated soil during construction and/or utilities trenching activities. In particular, this may be the case for the sites scheduled for the CDC, and the Athletic Fields, but may also apply at other construction and demolition sites. In addition to buried historical ACM that may be encountered during excavation and trenching activities, some of the structures scheduled for demolition may contain asbestos insulation and/or floor/ceiling tiles. In particular, Building 19 is believed to contain asbestos insulation, while Buildings 902 and 1011 are also expected to contain ACM. All potential consequences related to ACM will be evaluated in Section 4, Environmental Consequences.

### **3.18 NOISE**

The ROI for noise is the approximately 636 acres scheduled for construction/demolition and operations, ELUA development areas, and adjacent sites associated with the Proposed Action. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Human response to noise can vary according to the type and characteristic of the noise source, the distance between the noise source and the receptor, the sensitivity of the receptor, and the time of day. Community noise levels usually change continuously during the day, and also exhibit a daily, weekly, and yearly pattern.

Base activities that have the highest potential source for noise impacts are the aircraft/airspace operations. An AICUZ Study (COANG, 1998) plotted the DNL from 65 to 80 dB for a typical busy day at Buckley AFB. The DNL 65 dB contour covers the main runway, and extends approximately one mile southeast and one mile northwest over Aurora, Colorado in Arapahoe County. Most of the base is within the 65 dB contour (COANG, 1998). No noise studies have

been performed at the Buckley AFB CIP EA project sites. It can be assumed that the activities associated with the CIP EA projects would not produce noise above 65 dB DNL at sensitive receptors on a regular basis.

### **3.19 SAFETY**

The ROI for safety is Buckley AFB. The evaluation area for safety is Buckley AFB. Aircraft mishaps are the primary concern for safety with regard to military training flights. Mishaps are classified from Class A (can include fatality, costs greater than \$1 million, or destruction of military aircraft) to Class D or less (total damages less than \$1,000). Two Class A mishaps affected Buckley AFB in 1993 and 1994. Buckley AFB has reported no additional aircraft mishaps since those occurring in 1993 and 1994. The Accident Potential Zones (APZs) and Clear Zones (CZ) at Buckley AFB extend 15,000 feet from both ends of the runway. Buckley AFB has developed a Bird Aircraft Strike Hazard (BASH) plan to minimize the threat and occurrence of bird strikes and wildlife hazards. QD arcs for storage of explosive materials exist in portions of the base, and may occur near elements of the Proposed Action.

### **3.20 POLLUTION PREVENTION**

In FY04, Buckley AFB diverted 2,014 tons of solid waste from landfill disposal via recycling. Additional resource conservation activities on Buckley AFB include building “green” for many of the recent building construction projects.

The Proposed Action would be subject to all pollution prevention programs at Buckley AFB, including the RCRA program’s hazardous waste minimization plan. Relative to federal facilities compliance with RCRA Section 6002, opportunities for use of designated and other recycled content products would be identified. Environmentally beneficial landscaping would also be implemented as part of the ADP development. Additional opportunities for building "green" for the Proposed Action would be identified during the design of new facilities. In accordance with 40 CFR 989.31, potential pollution prevention measures, including resource conservation and recycling opportunities, would be identified during the project design phase, and prior to initiation of Proposed Action demolition, construction and/or completed facility operation activities.

### **3.21 ENVIRONMENTAL JUSTICE**

Existing environmental justice conditions were analyzed using the United States Census 2000 summary data in accordance with the methods presented in the 1997 Air Force (AF) publication: *“Guide for Environmental Justice Analysis with the Environmental Impact Analysis Procedure”* (USAF, 1997a). Using this reference the analysis determined that 5.8 percent of the Arapahoe County population lives below the 2000 poverty level of \$8,794 (for an individual) or \$13,738 (family of three) (USCB, 2000). In 2000, the general population of Arapahoe County was 79.7 percent White, 7.7 percent Black, 3.9 percent Asian, and 8.7 percent all other races or a combination of races (USCB 2003). Poverty status between 1990 and 2000 in Arapahoe County remained approximately constant at 5.8 percent below the poverty threshold (USCB 2003).

**SECTION 4****ENVIRONMENTAL CONSEQUENCES**

The environmental effects of the Proposed Action, Alternative Action 1, and the No Action Alternative are discussed in this section.

**4.1 COMPARISON OF THE ENVIRONMENTAL EFFECTS OF ALL ALTERNATIVES**

Table 4.1 lists all environmental consequences and indicates if individual consequences will be dismissed or retained for consideration in this EA. Reasoning for consequences that are dismissed was provided in Section 3. Consequences that are retained will be assessed for the Proposed Action, Alternative Action 1, and the No Action Alternative within this section.

<b>Table 4.1 Comparison of Environmental Consequences</b>	
<b>Impact Topic</b>	<b>Dismissed/Retained (per Section 3 Discussion)*</b>
Air Quality	Retained
Geology and Topography	Dismissed
Soils	Retained
Hazardous Materials	Retained
Hazardous Wastes	Retained
Historic Structural Resources	Retained
Land Use and Aesthetics/Visual	Retained
Socioeconomics	Retained
Historic Archaeological and Cultural Resources	Dismissed
Utilities	Retained
Biological Resources	Retained
Traffic/	Retained

<b>Table 4.1 Comparison of Environmental Consequences</b>	
<b>Impact Topic</b>	<b>Dismissed/Retained (per Section 3 Discussion)*</b>
Transportation	
Water Resources	Retained
Floodplains and Wetlands	Retained
Radon	Retained
Lead-Based Paint	Retained
Asbestos	Retained
Noise	Retained
Airspace	Dismissed
Safety	Retained
Pollution Prevention	Retained
Environmental Restoration Projects	Dismissed
PCBs	Dismissed
Environmental Justice	Retained

\* See Section 3 for discussion of resources not expected to be impacted by the Proposed Action, explanations of why resources would not be expected to be impacted, Section 3.1.1 for dismissal of Cultural Resources; Section 3.1.2 for dismissal of Geology and Topography; Section 3.1.3 for Airspace; 3.1.4 for Environmental Restoration Sites; and 3.1.5 for PCBs.

The direct and indirect effects associated with the Proposed Action, Alternative Action 1, and the No Action Alternative is further assessed in separate sections below.

## 4.2 COMPARISON OF THE CUMULATIVE EFFECTS OF ALL ALTERNATIVES

The Council on Environmental Quality (1978) regulations for implementing NEPA requires assessment of cumulative effects in the decision-making process for federal actions. Cumulative effects are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions

regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative effects are considered for the Proposed, Alternative Action and No Action alternatives.

Cumulative effects were determined by combining the effects of the alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other past, ongoing, or reasonably foreseeable future actions that have the potential to have a cumulative effect in conjunction with this Buckley AFB CIP action.

Under the Proposed Action, the effects of some projects have already been addressed under other EAs (See Table 2.21a) and/or are in EA’s that are being prepared concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis. However, this EA assess the cumulative impacts from these projects.

#### **4.2.1 Past, Present and Future Actions**

Past actions considered include Buckley AFB's past, dating back to 2000 when it stood up as an Air Force Base, development of the DIA, and the former Lowry AFB. Present and on-going actions include currently ongoing Buckley AFB projects, the proposed Buckley AFB CIP projects, CIP projects planned by the City of Aurora for the 2003–2004 CIP budget, the Lowry AFB and Fitzsimons Redevelopment Authority’s, and RTD’s transportation improvements.

Reasonably foreseeable future actions evaluated include the proposed City of Aurora 2005–2008 CIP, the RTD transportation plan, and Buckley CIP projects whose construction schedules have not yet been determined (TBD). Buckley AFB projects designated as TBD are assumed to be constructed sometime after December 31, 2010.

Potential cumulative effect issues that were identified and addressed in the cumulative impact analysis include:

- Off-base residential areas including west and north of the Paul C. Beck Center/Springhill Golf Course, Halifax Way, Genoa Court, and the eastern side of Louisiana and Arkansas Avenues are subject to noise levels above DNL 65 dB (Buckley AFB 1998). Current and future development of the portions of Arapahoe County and the City of Aurora may increase the proportion of residential, office, or commercial development bordering

Buckley AFB. Development of Buckley AFB and land bordering Buckley AFB could contribute to incremental increases in sensitivity to noise, and land uses affected by air operations.

- Closure of Lowry AFB and the FAMC and change of facility use from a National Guard Base to an active AFB created a need for expanded facilities on Buckley AFB. Redevelopment of the FAMC to a new 217-acre Colorado University (CU) Medical Campus is expected to create 34,000 new jobs over six years. It is expected that this complex would attract more health and medical education, service and supply businesses to the I-225/6<sup>th</sup> Avenue. The Proposed Action would add approximately 1.9 million ft<sup>2</sup> of additional administrative building areas. The increase in Buckley AFB and CU Medical Campus personnel would require new housing to accommodate the increased population. The overall population increase at Buckley AFB resulting from the Proposed Action would be between 450 and 640 personnel by 2010.
- Current and future development in the City of Aurora is rapidly expanding on the east side of Buckley AFB. Projected residential growth rates are expected to occur at 1.8 percent per year at a density of 3.5 units per acre, or 514 acres on an annual basis. Office and industrial uses are also projected to grow at 1.8 percent per year at a Floor Area Ratio ranging from 0.25 to 0.35, or a total of 210 acres annually. Retail and commercial development would comprise approximately 20 acres per year. Land use development surrounding Buckley AFB would therefore expand at a rate of 744 acres per year totaling 5,952 acres for the entire City by 2002-2010 and (City of Aurora 1998).
- Transportation corridors such as 6<sup>th</sup> and Mississippi Avenues, I-225, and E-470 provide access to and from major arterials and interstate highway systems connecting to Buckley AFB. RTD bus systems provide some service connections within the area. Development on Buckley AFB could cause an incremental increase in operational and residential traffic on Buckley AFB and the surrounding arterial and connector roads. Future Transportation Plans such as LRT inter-and multi-modal connections, enhanced interchanges, bikeway and pedestrian paths/connections would improve transportation services in the area.



- The former Air National Guard installation was a minimally developed and landscaped installation suitable to meet the needs of weekend influxes of reserve component personnel. Recent development on Buckley AFB has created quality employment facilities promoting land use compatibility between the installation and the surrounding civilian community. Future community support facilities such as the Williams Lake ADP, recreation facilities, open space and other quality of life amenities are planned. These community outdoor/recreation services would serve the needs of military personnel both living on and off the base. A future City of Aurora Park to be located on the western side of the base and Airport Boulevard, would serve both the City of Aurora and Buckley AFB residents. Increased use of open space could affect the visitor use and experience.
- Refurbishing existing facilities and development of new facilities using sustainable design/development standards contributes to reductions in energy and other utilities. The Buckley AFB GP and future 2020 Buckley AFB Master Plan would be prepared to ensure sustainable development, and to provide facilities for future operations. The future planning process would be cooperative.

#### **4.3 PROPOSED ACTION**

##### **4.3.1 Air Quality**

The Proposed Action would affect air quality in three ways; (1) the construction and demolition activities would produce fugitive dust and pollutants from vehicle and heavy equipment exhaust; (2) the operation of new buildings and facilities would increase emissions from furnaces, hot water heaters and/or backup generators and tanks used to store fuels for these sources; and (3) increased traffic associated with use of new facilities would cause automobile emissions. In addition, ODS contained in air conditioning units for climate control would need to be properly managed to prevent releases to the atmosphere. These effects would be considered direct, as they would occur at the same time and place (i.e. point of emission from vehicle and equipment exhaust; stacks and/or vents for furnaces, hot water heaters and backup generators; and loss of ODS from heating, ventilating and air conditioning [HVAC] systems).

#### **4.3.1.1 Emissions from Construction and Demolition Activities**

Construction and demolition activities associated with the Proposed Action would create fugitive dust emissions from the following activities:

- Ground Disturbance (scrapping, bulldozing, and compacting)
- Site Grading
- Foundation Excavation
- Utilities Trenching
- Material Handling (soils, aggregate, and demolition debris/waste)
- Vehicle Travel on Paved and Unpaved Roads
- Construction
- Demolition
- Walk-way and Parking Lot Preparation
- Walk-way and Parking Lot Paving and Painting
- Sidewalk Preparation and Paving
- Landscape and Turf Installation
- Miscellaneous Emissions (equipment trackout, windblown dust, etc.).

Fugitive dust emissions generated from individual CIP EA projects would depend on the extent and duration that the activities listed above are performed to complete each project. For purposes of this EA, fugitive dust emissions were estimated based on the area of ground disturbance related to each construction project. Areas of ground disturbance were assumed at maximum anticipated footprint sizes, with contingency for contractor lay-down and preparation areas. Conservative assumptions related to distances required for utility trenching, vehicle travel on paved and unpaved roads and material handling were also made for calculating emissions. Appendix B contains a table showing estimated individual construction project ground disturbance durations, areas of ground disturbance, and utilities trenching distances and Appendix C contains a similar table for demolition projects. Fugitive dust, as PM<sub>10</sub>, emissions

for demolition projects were estimated using the USAF Air Conformity Applicability Model (ACAM) (Version 4.0.3). ACAM takes into consideration the building areas and interior structures (walls and integrated components).

ACAM is a screening tool that was used to calculate annual air emissions from individual construction and demolition project information that is input into the program. The ACAM was used to estimate emissions from the construction and demolition phases of the Proposed Action. The ACAM calculates construction emissions based on algorithms developed by South Coast and Santa Barbara Air Quality Management Districts from California, and it incorporates the USEPA's Mobile 6, a regulatory on-road source model to calculate on-road vehicle emissions (Air Force Center for Environmental Excellence, 2004; South Coast Air Quality Management District, 1993; Sacramento Metropolitan Air Quality Management District, 1994). The ACAM output, assumptions and graphs are included in this EA as Appendix D, Construction/Demolition Air Emission Calculations.

Best management practices (BMPs) that would be specified in the fugitive dust control plan, if required, and would be instituted on-site to minimize fugitive dust emissions, may include the application of water or other chemical stabilizers on exposed earth surfaces, and other preventive techniques. Water may be applied to construction roadways and earth stockpiles to control dust created through vehicle and equipment travel and operations. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction and vehicle and equipment travel activities:

- Applying water on haul roads and other exposed earth surfaces
- Wetting equipment and excavation faces
- Spraying water on buckets during excavation and dumping
- Hauling materials in properly tarped or watertight containers
- Restricting vehicle speeds to 10 mph
- Covering excavated areas and material after excavation activity ceases
- Reducing the excavation size and/or number of excavations.

Experience has shown that utilizing the above-mentioned dust suppression techniques, within reason would not result in excess water which would result in unacceptable wet conditions. Using atomizing sprays would prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust. In addition, control techniques such as chemical stabilization, or reduction of surface wind speed with windbreaks (snow fence, silt fence) or source enclosures (netting, mulching) can be employed to suppress dust generation and migration without the use of waster.

Additional BMPs and preventive techniques can be employed to reduce dust generation and migration. BMP measures may entail the periodic removal of dust-producing materials, including periodic street and access road sweeping and expeditious clean-up of materials spilled on paved or unpaved travel surfaces. Preventive process modifications and adjusted work practices include gravelling of dirt access roads and work areas, the elimination of mud/dirt carryout on paved roads at construction sites and vehicle washing. These measures would aid in preventing or reducing the deposition of materials that could become airborne through vehicle and equipment traffic or by wind.

Combustion emissions from vehicles and heavy equipment would be generated while delivering materials to Buckley AFB, as well as from operation of equipment on-base to complete ground disturbance phase of construction and demolition projects. Emissions from vehicles used by contractor employees to drive to and from Buckley AFB must also be considered. Pollutants from vehicle and heavy equipment exhaust include NO<sub>x</sub>, CO, PM<sub>10</sub>, and VOCs.

Table 4.2 shows the annual estimated pollutant emissions (from 2002<sup>2</sup> and beyond) that may result from construction and demolition projects included in the Proposed Action. ACAM was used to calculate these emission estimates. Fugitive dust emissions are included in PM<sub>10</sub> values.

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<sup>2</sup> While the Air Force Base stood up in October 2000, construction projects did not begin until 2002. This was due to the time it took to plan and prepare for construction.

<b>Table 4.2: Construction and Demolition Cumulative Project Emissions <sup>(1)</sup></b>					
<b>Year</b>	<b>Emissions Generated from Construction and Demolition Site Disturbance Activities (Tons/Year)</b>				
	<b>VOC</b>	<b>NO<sub>x</sub></b>	<b>SO<sub>2</sub></b>	<b>CO</b>	<b>PM<sub>10</sub></b>
2002	1	4	0	10	13
2003	5	26	3	73	40
2004	11	37	4	112	32
2005	20	57	6	156	139
2006	11	39	4	114	32
2007	6	31	3	82	43
2008	10	50	5	144	26
2009	6	30	3	82	60
2010	3	15	1	36	8
TBD <sup>(2)</sup>	1	9	0	13	26

(1) Emissions from construction and demolition activities would be considered short-term since they would be emitted during the actual construction/demolition project. Therefore, their emissions are cumulative per “year” versus “all” years.

(2) TBD = To Be Determined for projects scheduled beyond 2010 (year of completion currently unknown/unspecified).

#### **4.3.1.2 Emissions from Completed Building and Facility Operation Activities**

The only stationary source of emissions from completed buildings and facilities would be from furnaces, hot water heaters and/or emergency generators and associated fuel tanks that would be installed and operated as part of individual Proposed CIP EA projects. Emissions that are created from operation of natural gas-fired furnaces and hot water heaters installed as part of the Proposed Action can be estimated assuming an increase in natural gas use. The increase in natural gas use can be estimated on the bases of new building areas. Currently, Buckley AFB installation facilities consist of approximately 2.7 million gross ft<sup>2</sup> (Buckley AFB 2005b), and uses approximately 417,000 ft<sup>3</sup> of natural gas per day. Full implementation of the Proposed Action would add a total additional 1.9 million ft<sup>2</sup> (approximately) of building area to the base. Assuming a direct ratio of building areas to natural gas use, the Proposed Action would result in an overall increase in natural gas use of approximately 310,00 ft<sup>3</sup> per day, or 110 mmft<sup>3</sup> per year

when all construction projects have been completed. Assuming that new furnaces and hot water heaters would be sized at 0.3-10 million British Thermal Units per hour (mmBTU/hr) annual and cumulative emission calculations for the operation of these units are shown below on Table 4.3 (also refer to Appendix D, Construction and Operation Air Emissions Calculations).

**Table 4.3 Heating and Hot Water Unit Air Emissions<sup>(1)</sup>**

Year	Emissions Generated from Operation of Heating and Hot Water Units (Tons/Year)									
	VOCs		NO <sub>x</sub>		SO <sub>2</sub>		CO		PM <sub>10</sub> <sup>(2)</sup>	
	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative
2002	0.01	0.01	0.26	0.26	0.00	0.00	0.22	0.22	0.02	0.02
2003	0.04	0.05	0.64	0.90	0.00	0.01	0.54	0.76	0.05	0.07
2004	0.05	0.10	0.89	1.79	0.01	0.01	0.75	1.51	0.07	0.14
2005	0.09	0.18	1.57	3.36	0.01	0.02	1.32	2.82	0.12	0.26
2006	0.02	0.20	0.33	3.69	0.00	0.02	0.28	3.10	0.03	0.28
2007	0.02	0.22	0.37	4.06	0.00	0.02	0.31	3.41	0.03	0.31
2008	0.01	0.24	0.24	4.30	0.00	0.03	0.20	3.61	0.02	0.33
2009	0.04	0.28	0.70	5.00	0.00	0.03	0.59	4.20	0.05	0.38
2010	0.00	0.28	0.04	5.05	0.00	0.03	0.04	4.24	0.00	0.38
TBD <sup>(3)</sup>	0.03	0.30	0.48	5.53	0.00	0.03	0.40	4.64	0.04	0.42
Cumulative Totals	0.30	0.30	5.53	5.53	0.03	0.03	4.64	4.64	0.42	0.42

(1) Emission factors are for external combustion sources <0.3 mmBTU/hr that burn natural gas.

(2) Since no emission factor is provided for PM<sub>10</sub>, it is assumed that total particulates equal PM<sub>10</sub>.

(3) TBD = To Be Determined for projects scheduled beyond 2010 (year of completion currently unknown/unspecified).

Mobile emissions would be created through increased traffic associated with additional personnel resulting from the Proposed Action and from turf and landscaping maintenance activities. Emissions created from increased traffic are addressed in Section 4.3.1.3, Increased Traffic. Turf and landscaping maintenance activity sources may include lawn mowers and tractors, turf maintenance equipment (thatchers, aerators, etc.) and gasoline operated pruning equipment. Emissions from these sources would be NO<sub>x</sub>, CO, SO<sub>2</sub>, PM<sub>10</sub>, and VOCs, however emission from these sources would be negligible.

#### **4.3.1.3 Increased Traffic**

The Proposed Action would increase the daily traffic flow in the ROI and on-base. USEPA emission factors were used to calculate the potential increase in emissions due to the Proposed Action. USEPA provides exhaust emission rates for high altitude light duty gasoline-powered vehicles. However, it does not provide emissions for PM<sub>10</sub> and they are assumed to be negligible for the Proposed Action. The following assumptions were made:

- 10 percent of the personnel would live on-base and drive themselves to work daily and would not carpool,
- 90 percent of the personnel would live 20 miles from base and would drive 40 miles roundtrip,
- Off-base personnel would travel to Buckley AFB 260 days per year,
- Each person drives a 2000 model-year vehicle, and
- Each vehicle has been driven 50,000 miles.

Emissions from operation of personal vehicles resulting from the Proposed Action are provided below on Table 4.4. Values are shown for annual and cumulative emissions.



**Table 4.4 New Personal Vehicle Pollutant Emissions**

Year	Emissions Generated from New Personal Vehicles (Tons/Year)					
	Hydrocarbons		NOx		CO	
	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative
2002	0.14	0.14	0.14	0.14	2.96	2.96
2003	0.35	0.49	0.35	0.49	7.32	10.28
2004	0.48	0.97	0.48	0.97	10.12	20.39
2005	0.85	1.82	0.85	1.82	17.83	38.22
2006	0.18	2.00	0.18	2.00	3.78	42.00
2007	0.20	2.20	0.20	2.20	4.23	46.24
2008	0.13	2.33	0.13	2.33	2.70	48.93
2009	0.38	2.71	0.38	2.71	8.00	56.93
2010	0.02	2.73	0.02	2.73	0.50	57.43
TBD <sup>(3)</sup>	0.26	3.00	0.26	3.00	5.47	62.90
Cumulative Totals	3.00	3.00	3.00	3.00	62.90	62.90

(1) Based on each off-base employee traveling to Buckley AFB 260 days per year.

(2) TBD = To Be Determined for projects scheduled beyond 2011 (year of completion currently unknown/unspecified).

In addition, some off-base personnel may make trips to Buckley AFB to participate in sports activities, or other organized events, after normal duty hours. However, traffic increases and resulting vehicular air emissions due to off-base personnel using the fields would have a minimal impact, as the number of individuals, and time of day and frequency of trips to the base would be insignificant. Although the fields may also be used for other events (i.e. concerts, tournaments, etc.), only base personnel would be allowed to attend these events (the general public would not be permitted to access these events). Therefore these events would have no or minimal impacts on air emissions.

#### **4.3.1.4 Air Conformity Analysis for the Proposed Action**

Federal actions must comply with the USEPA Final General Conformity Rule published in 40 CFR 93, Subpart B (for federal agencies). The Final Conformity Rule, which took effect on 31 January 1994, requires all federal agencies to ensure that proposed agency activities conform to an approved or promulgated SIP or Federal Implementation Plan (FIP). Conformity means compliance with a SIP or FIP for the purpose of attaining or maintaining the NAAQS. Specifically, this means ensuring the federal activity does not: 1) cause a new violation of the NAAQS; 2) contribute to an increase in the frequency or severity of violations of existing NAAQS; 3) delay the timely attainment of any NAAQS; or 4) delay interim or other milestones contained in the SIP for achieving attainment.

An increase in baseline emissions would be anticipated due to construction of the Proposed CIP EA projects. For purposes of analysis, it was assumed that the specific details proposed for the Proposed Action construction and demolition activities are those specified in Section 4.3.1.1. The assumed periods required for the ground disturbance phase of construction and demolition are as shown on tables contained in Appendices A and B, respectively. Sections 4.3.1.2 and 4.2.1.3 assessed emissions from completed building operations and increased traffic that would result from the Proposed Action, respectively.

The final Conformity Rule provides two components for evaluating new emissions. Compliance with the rule is assessed by conducting a conformity applicability analysis; and if *de minimus* or regional significance is exceeded, a conformity determination is conducted. The Conformity Rule provides two significance thresholds for emissions from a federal action: (1) a regionally significant action is a federal action for which the emissions of any pollutant represent

10 percent or more of an area's emissions inventory for that pollutant, (2) if emissions of any pollutant exceed the *de minimus* emission thresholds for non-attainment and maintenance areas, the emissions are significant. Total emissions within AQCR 36, 10 percent of the AQCR 36 emissions, and the *de minimus* thresholds for maintenance areas are provided on Table 4.5. The annual emissions are presented in Table 4.5 and include the estimated annual emissions created through operation of buildings and increased traffic. Values are included for annual and cumulative emissions. Cumulative emissions are presented for informational purposes and to assess cumulative impacts, but are not considered in conformity determinations, as conformity is assessed on an annual emissions basis only. In some cases, cumulative emissions from year to year decrease. The reason for this decrease is that emissions from short-term construction/demolition activities would occur on an annual basis and would not be additive, while long-term emissions created from operation of building and increased traffic would be additive. As buildings are completed through each progressive year of Proposed Action implementation, emissions from operation of the buildings would increase cumulatively each year. This circumstance also holds true for emissions created by the increase in the number of employees traveling to the base to occupy and work in completed buildings as each subsequent year of Proposed Action projects are completed. The estimated values for CO, VOC, NO<sub>x</sub>, SO<sub>x</sub>, and PM<sub>10</sub> were determined to be less than the USEPA *de minimus* values and less than 10 percent of the AQCR 36 Emission inventory (see Table 4.5) on an annual basis throughout the period required to complete all projects included in the Proposed Action. A conformity determination under the CAA conformity rules is not required because 1) the Proposed Action is not regionally significant because the AQCR 36 emissions would increase by less than 10 percent, and, 2) the Proposed Action estimated emissions are below *de minimus* values as stated in 40 CFR 93.153(b). Because the Proposed Action's emissions do not exceed 10 percent of the AQCR 36 emissions or the *de minimus* values as stated in 40 CFR 93.153(b), the Proposed Action would conform to the SIP and would not have a significant impact on air quality.

**Table 4.5 Proposed Action Air Emission Totals**

Year	Emissions (Tons/Year)									
	VOCs		NO <sub>x</sub>		SO <sub>2</sub>		CO		PM <sub>10</sub>	
	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative
2002	1.16	1.16	4.40	4.40	0.00	0.00	13.18	13.18	13.02	13.02
2003	5.38	6.54	26.99	31.39	3.00	3.01	80.86	94.04	40.05	53.07
2004	11.53	18.07	38.37	69.76	4.01	7.01	122.86	216.90	32.07	85.14
2005	20.94	39.00	59.42	129.18	6.01	13.02	175.15	392.05	139.12	224.26
2006	11.20	50.20	39.51	168.69	4.00	17.02	118.06	510.10	32.03	256.28
2007	6.22	56.43	31.57	200.27	3.00	20.02	86.55	596.65	43.03	299.31
2008	10.14	66.57	50.37	250.63	5.00	25.03	146.90	743.55	26.02	325.33
2009	6.42	72.99	31.08	281.72	3.00	28.03	90.59	834.14	60.05	385.38
2010	3.03	76.01	15.07	296.78	1.00	29.03	36.54	870.67	8.00	393.38
TBD <sup>(1)</sup>	1.29	77.30	9.74	306.52	0.00	29.03	18.87	889.54	26.04	419.42
<b>AQCR 36 Emission Inventory<sup>(2)</sup></b>	167,900		112,785		69,350		678,170		32,156	
<b>10 Percent of AQCR 36 Emissions<sup>(3)</sup></b>	16,790		11,279		6,935		67,817		3,216	
<b>De minimus Values<sup>(3)</sup></b>	100		100		100		100		100	
<b>Above/ Below De minimus</b>	Below		Below		Below		Below		Below	

(1) CAQCC, 2003, 2001a, b.

(2) Colorado Air Quality Control Commission (CAQCC), 2003 (CO-2006 Interim Year Inventory), 2001a, (VOC and NO<sub>x</sub> 2006 Inventory), and 2001 b (PM<sub>10</sub> and SO<sub>x</sub> 2005 Maintenance Inventory).

(3) Units Tons/Year.

#### **4.3.1.5 ODS**

ODS containing equipment at Buckley AFB is currently serviced and maintained by a certified HVAC personnel or contractors. New HVAC equipment containing ODS installed and operated as part of the Proposed Action would be serviced and maintained per the existing practice. Certified HVAC personnel or contractors would be required to follow appropriate ODS regulations for new equipment including:

- Add new air conditioning units exceeding the 50 lbs refrigerant threshold to the inventory of appliances containing ODS refrigerants in excess of 50 lbs (40 CFR 82.166(k)).
- Maintain records of ODS refrigerants purchased for use at the facility (40 CFR 82.166(k)).
- Maintain records of ODS equipment leaks (calculations of leak rates and percentages) and repairs (40 CFR 82.156(i)(2)).

No impacts would be expected from installation and operation of ODS containing equipment, as the equipment installed and operated would be new, and would be inspected and maintained by certified HVAC personnel or contractors.

#### **4.3.1.6 Cumulative Impacts**

The area evaluated for cumulative impacts includes the “*area of applicability*” and includes county air emission inventories that may ultimately be excluded from the non-attainment boundaries designated by the EPA, and therefore, from the scope of Colorado’s Early Action Compact (EAC) Ozone Action Plan (CAQCC 2004). Colorado’s air quality analysis uses emission inventories from most of the western United States. The “*area of applicability*”, or ROI used for analysis in this EA is not considered a geographic area. The cumulative impacts are based on this analysis; therefore the area evaluated for cumulative impacts is consistent with EAC.

As with development and construction of buildings and facilities at Buckley AFB, development of areas within the ROI would create air emissions from construction and demolition activities, the operation of new buildings, and facilities and increased traffic associated with use of new facilities. While emissions from operation of buildings and facilities at Buckley AFB would generally be created by use and occupation of the structures (personal vehicle travel, HVAC and hot water heating), emissions created through development within the

ROI would likely encompass a larger number of source-types. Although a significant portion of development within the ROI would consist of residential development, light industrial, commercial and retail development would also occur. While some emissions from non-residential sources would be similar to those created by residential building operations, greater emission types, concentrations, and volumes are likely to result from light industrial, commercial and retail development. For example, light industrial development may result in increased combustion emissions if facilities require heating and cooling to operate production processes. Likewise, development of commercial establishments, such as dry cleaning operations, would result in emissions of VOCs and potentially HAPs.

Management of emissions on a cumulative basis throughout the ROI would be accomplished through existing source permitting, monitoring and reporting requirements. All new sources would be subject to existing applicable permitting requirements. Air emission permit requirements and mechanisms incorporated in the EAC to insure proper management of existing and anticipated new source emissions are discussed below for criteria pollutants and ozone precursors.

### **Criteria Pollutants**

Air pollution and poor visibility are persistent concerns in the DMA. Cumulative emissions of criteria pollutant are regulated through the CDPHE's ACP and APEN application and approval process. Through this system ACP and APEN permit requirements are triggered by uncontrolled actual emission rates.

A construction permit would be required for any facility that has uncontrolled actual emissions of any criteria pollutant equal to or greater than the amounts listed in Table 4.6 below and is otherwise not exempt (CDPHE 2005c)

<b>Table 4.6: CDPHE New or Modified Source Construction Permit Emission Thresholds*</b>		
<b>Criteria Pollutant</b>	<b>Uncontrolled Actual Emissions in Tons Per Year</b>	
	<b>Attainment/Maintenance Areas</b>	<b>Non-Attainment Areas</b>
VOCs	5	2
PM <sub>10</sub>	5	1
Total Suspended Particulates	10	5
Carbon Monoxide	10	5
Sulfur Dioxide	10	5
Nitrogen Oxides	10	5
Lead	200 pounds per year	200 pounds per year

\* Source CDPHE 2005c.

Permits are issued for the level of production/operation requested on the APEN. For criteria pollutants, APEN requirements differ for Colorado's attainment/maintenance and non-attainment areas. In general, an APEN is required for an emission point with uncontrolled actual emissions of any criteria pollutant equal to or greater than the quantity listed in the Table 4.7 below:

<b>Table 4.7: CDPHE APEN Criteria Pollutant Emission Thresholds*</b>	
<b>Area</b>	<b>Uncontrolled Actual Emissions</b>
Attainment/Maintenance	2 Tons per Year
Non-Attainment	1 Ton per Year
All Areas	Lead Emissions: 100 pounds per year

\*Source CDPHE 2005c.

Sources of non-criteria reportable air pollutants have different reporting levels depending on the pollutant, release point height and distance to property line.

Cumulative emissions of SO<sub>2</sub>, CO and PM<sub>10</sub> would be adequately controlled and monitored through the existing CDPHE ACP and APEN permitting systems. If current permitting requirements are met, cumulative impacts from existing and anticipated new sources of criteria emissions would be considered moderate and would not be considered significant.

### **Ozone Precursors**

On a cumulative basis the control of emissions that contribute to the formation of ground-level ozone (VOCs and NO<sub>x</sub>) is regulated through the CDPHE's ACP and APEN application and

approval process, as described above. The EAC also contains several mechanisms intended to insure that the commitments to meeting the compliance milestones (see Section 3.2.2) and deadlines are met.

Baseline and control case modeling VOCs and NO<sub>x</sub> inventories were assessed for all of the eight counties in the Denver/Boulder/Greeley consolidated statistical metropolitan area (CMSA), including Denver, Jefferson, Douglas, Broomfield, Boulder, Adams, Arapahoe, and Weld, counties. The emission estimates were developed based on the most recent demographic data and vehicle miles traveled (VMT) estimates contained in 1) Denver Regional Council of Government's (DRCOG) conformity analysis for the updated fiscally constrained element of the 2025 Regional Transportation Plan, and 2) North Front Range Transportation and Air Quality Planning Council's 2025 Regional Transportation Plan. The inventories are presented in Table 4.8.

<b>Table 4.8: Air Emissions Modeling ROI*</b>				
<b>Source Category</b>	<b>Emissions in Tons Per Year</b>			
	<b>2002 VOCs</b>	<b>2007 VOCs</b>	<b>2002 NO<sub>x</sub></b>	<b>2007 NO<sub>x</sub></b>
Point sources	192.8	204.1	105.2	107.1
On-road motor vehicles	152.8	117.5	157.8	119.3
Non-road vehicles	73.1	53.7	88.0	85.2
Area sources	96.9	104.1	25.6	27.6
Total	515.6	479.4	376.6	336.5

\* Source: EAC, Ozone Action Plan, Proposed Revision to the State Implementation Plan, CDPHE, CAQCC, and the Regional Air Quality Council (RAQC), March 12, 2004.

The EAC lists the additional control measures, above and beyond those assumed in the 2007 base case inventory that are incorporated into the SIP to demonstrate attainment/maintenance of the 8-hour ozone NAAQS by 2007 and maintenance of such standard through 2012.

The EAC includes an amendment to Title 5 CCR 1001-9 Regulation Number 7 (Emissions of VOCs) that may be applicable at Buckley AFB. The amendment would require the installation of controls on new and existing rich burn and lean burn natural gas fired stationary reciprocating internal combustion engines (RICE) larger than 500 horsepower located in the 8-hour ozone



control area. However, Buckley AFB does not currently and does not expect to install and/or operate any equipment utilizing RICE in the future.

The regions aircraft activity contributes an estimated 4.4 percent of the region's total NOx emissions (DRCOG 2002). To meet regional aviation demands through the year 2020, the *2020 Regional Aviation System Plan* projects capacity improvements to existing public airports and the addition of at least one new airport. Improved engine designs would continue to improve emissions for smoke and hydrocarbons and reduce the proportion of carbon monoxide and NOx from aircraft emissions in the future. There are no plans to expand the Airfield-Industrial Complex (i.e. Airfield, Mission Operations and Maintenance, and Industrial ELUA's). Future development would provide flexibility related to mission changes that may occur in the future. Mission changes may entail types of aircraft, taxiway or aircraft hanger expansions and relocations.

Completion of the ADP and ELUA projects would provide new and increased pedestrian and bicycle routes on-base, reducing the dependence on single occupant vehicles. The long-term cumulative effects on air quality related values and human health from particulate matter emissions would be adverse and range from minor to moderate.

Cumulative ozone precursor emissions would be adequately controlled and monitored through the existing CDPHE ACP and APEN permitting systems and provisions contained within the EAC. Since Buckley AFB does not currently and does not expect to install and/or operate any equipment utilizing RICE in the future, the Title 5 CCR 1001-9 Regulation Number 7 requirements would not apply. If current permitting and EAC requirements are met, cumulative impacts from existing and anticipated new sources of ozone precursor emissions would be considered moderate and would not be considered significant.

#### **4.3.2 Soils**

Most of the areas designated for the CIP EA demolition and construction projects are on previously disturbed soils. These and other soils throughout the area are well-drained although some Alluvial Land-Nunn soils have higher water holding capacity with moderate to slow permeability. Soil associations for the areas designated for the CIP EA demolition and construction projects are shown on Table 4.9. Since these soils are well-drained soil erosion

impacts resulting from construction and demolition activities would be minimal if proper BMPs are practiced.

<b>Table 4.9: ADP Existing Soil Characteristics</b>				
<b>ADP</b>	<b>Alluvial Land-Nunn (acres)</b>	<b>Fondis- Weld (acres)</b>	<b>Ranohill- Buick Little (acres)</b>	<b>Rock Outcrop (acres)</b>
ADP 1 - Privatized Housing	0.00	44.26	40.74	0.00
ADP 2 – Entry Gates	0.00	53.26	6.74	0.00
ADP 3 – Dormitory	0.00	123.94	0.00	0.00
ADP 4 – Aspen Corridor	0.32	107.48	11.78	0.00
ADP 5 – Community Center	0.00	49.57	6.92	0.00
ADP 6 – Industrial Support	0.00	28.79	0.16	45.75
ADP 7 – Headquarters Area	2.00	2.71	30.85	0.01
ADP 8 – Williams Lake	0.00	25.20	54.34	13.81
<b>Total</b>	<b>2.32</b>	<b>434.21</b>	<b>151.53</b>	<b>59.56</b>

Depending on future land use decisions, demolition projects, including the 4 projects in the Marine Compound area, will result in at least a temporary conversion of previously impervious surfaces returning to opened-soil conditions. It assumed that opened-soil areas created through demolition projects will naturally revert or be seeded and restored as mixed grass prairie areas. This may result in a minor positive impact on soils. However, land use decisions may reclaim these for future development, so the positive impacts may be temporary.

#### **4.3.2.1 Erosive Soils**

Top layers of soils exposed during demolition and construction would be subject to erosion. Impacts to soils would occur during site grading and trenching. Development areas are generally located on the upland areas of the site away from the majority of sensitive areas such as steep slopes. The ADPs and ELUAs have been designed to avoid building within sensitive areas.

Intermittent or ephemeral gully erosion may cause significant soil loss downstream from construction areas. Although surface water erosion accounts for only a minor portion of Colorado's total erosion due to the semi-arid climate of Colorado, there would be more soil loss due to localized wind disturbance. BMPs, such as installation of buffers for highly erodible soils

and steep slopes, would be used with a few exceptions and those exceptions would be supported by geo-technical analysis.

With the proper use of conventional soil conservation and BMPs and geo-technical analysis when needed, construction-related effects to soils would be short-term, minor, adverse and local. Therefore, impacts from increased run-off on erosive soils would not be anticipated. Currently productive soil would be made unavailable for other purposes due to new coverage by expanded parking lots, sidewalks and buildings. New sidewalks would be planned and positioned to reduce social trailing.

#### **4.3.2.2 Expansive Soils**

Construction excavations could expose small areas of expansive soils. These soils are not typically found outside of the drainages on Buckley AFB (see locations of the Alluvial Land-Nunn soil association Figure 3.1). Expansive soils such as clay, claystone, and shale would "swell" in volume when wetted and would shrink when dried. Clay properties control the degree to which the clay minerals swell.

Subsurface Colorado swelling soils tend to remain at constant moisture content in their natural state and are usually relatively dry at the outset of disturbance when constructing on them. Exposure to natural or man-caused water sources during or after development results in swelling. In many instances the soils do not regain their original dryness after construction, but remain somewhat moist and expanded due to the changed environment. This volumetric expansion and contraction can cause houses, buildings, and other structures to heave, settle, and shift unevenly. However, with the implementation of BMPs (primarily moisture control) for potential expansive soils, there would be no long-term or major short-term, impacts to soils from the Proposed Action.

#### **4.3.2.3 Cumulative Impacts**

The area evaluated for cumulative impacts include all land to be disturbed within the eight ADPs, the seven ELUAs and soils that are located within a 100-foot buffer from the Buckley AFB boundaries.

Soil resources have been historically subjected to many sources of disturbance since the base was established in the 1940s. Past aircraft operations, localized wind, off road vehicles and

military training have disturbed soils on Buckley AFB. Other sources of disturbance that have, and would continue to affect soils in the vicinity of the base include site excavation, grading, and outdoor recreational use (off-road vehicles, all terrain vehicles).

The incremental effect from future development of Buckley AFB on soil conditions would be indistinguishable from other types of urban development within the surrounding area. Silt fencing, temporary sediment basins, and other NPDES soil erosion control practices would reduce the small amount of soils lost during construction.

The proposed future land use and community development would bring additional personnel, vehicles, and aircraft operations in the region would produce a minor effect on soil resources. These effects would not be distinguishable from transportation and land development in the immediate area. Therefore cumulative effects would not result in long-term loss or impairment of soil resources.

#### **4.3.2.4 BMPs**

With the use of best management practices, such as applying water during dry periods or covering the soils during heavy rain events and using silt barriers to restrict the erosion of exposed soils, the effects to soil erosion would be reduced or minimized. BMP measures may include establishing limits of clearing and grading to protect and preserve riparian corridors, native grasslands, and implementing landscape plans that would stabilize soils.

Implementation of geotechnical surveys, appropriate structural designs, and appropriate building and grounds maintenance may help to minimize the risk of structural damage. The following BMP measures would be implemented in areas where there is potential for expansive soils.

- **Geotechnical Survey:** Geotechnical engineering methods would be used to identify expansive soil problems prior to construction.
- **Foundation Design:** Structural foundation designs would be used to withstand the "worst possible" changing soil conditions as indicated by testing.
- **Building and Grounds Maintenance:** Building maintenance crews would be educated about the soil situation and its potential significance, especially relative to the role of water and

drainage. Efforts would be made to prevent water from "ponding" around building foundations. Grass, shrubs, and sprinkler systems would be installed a minimum of 5 feet (ft) from the foundation. Trees and other plants requiring high moisture would be planted no nearer than 15 ft from a building.

#### **4.3.3 Hazardous Materials**

Contractors may use HAZMATs during construction and demolition projects. HAZMATs used during the construction of the Proposed CIP EA projects would include fuels, oils, lubricants and coolants used to operate vehicles and equipment, as well as concrete joint sealants, and paints required for foundations and building construction. Hazardous waste may be generated through use of HAZMATs during construction activities. Contractors that use HAZMATs would use them entirely or remove them from the installation for use on other projects. No HAZMATs would be left on-base as wastes. Contractors should seek to use "green building materials" as much as possible to avoid use of HAZMATs and subsequent generation of hazardous wastes.

LBP and asbestos wastes could also be generated through the process of utilities trenching or building, and structure demolition projects. Proper management of HAZMATs and wastes would potentially result in direct effects only. Additional details on hazardous waste management are provided below in Section 4.3.4, Hazardous Wastes.

HAZMATs that would be used during the operation of the Proposed CIP EA facilities would be ODS in air conditioning units, diesel fuel that may be stored and used to supply fuels to boilers and/or emergency backup generators, and an increase in medical materials and supplies used in the expanded Clinic. Proper management of ODS is detailed in Section 4.3.1.6, ODS Management Requirements. Medical materials used at the expanded Clinic would be managed per existing practices at the Clinic.

In addition, the new consolidated fuels facility would include petroleum, oil, and JP-8 tanks (210,000 gallons each), liquid oxygen tanks (3,000 gallons each), ethanol fuel tanks (10,000 gallons), biodiesel fuel tanks (10,000 gallons), gasoline tanks (10,000 gallons) diesel fuel tanks (10,000 gallons), a de-icer tank (10,000 gallons), a government fueling station, a POL pumping

station, and additional ancillary services such as containment areas, and concrete pads. Biodiesel and ethanol containing fuels are not currently stored or used on base.

No significant impacts related to HAZMATs would be expected from implementation of the Proposed Action.

#### **4.3.3.1 Cumulative Impacts**

The geographic area evaluated for HAZMAT cumulative impacts includes the City of Aurora. Cumulative impacts of the Proposed Action related to HAZMATs used for construction/demolition activities and operation of completed facilities coupled with other off-base new construction and operation projects (within the City of Aurora and County of Arapahoe Comprehensive Plans) would depend on the quantity and nature of the materials used. The quantity and the exact nature of the materials used on a cumulative basis are unknown. However, proper management and use of HAZMATs would prevent any resulting substantial impacts. Additional details on cumulative hazardous waste management are provided below in Section 4.3.4.1, Hazardous Wastes.

#### **4.3.4 Hazardous Wastes**

Hazardous wastes generated through Proposed CIP EA demolition projects could include LBP, and asbestos wastes or wastes generated through use and subsequent need for disposal of HAZMATs used during construction activities. However, the potential quantity and the exact nature of the wastes generated are unknown. In general, hazardous wastes and materials generated during construction and demolition activities would be managed according to all relevant regulations. Hazardous wastes would not be expected to be generated through operation of the proposed buildings and facilities.

If appropriate BMPs and sound designs are employed, adherence to all federal, state, and local regulations dealing with hazardous wastes are followed no significant impacts related to hazardous wastes would be expected from implementation of the Proposed Action. Proper management of hazardous wastes would potentially result in direct effects only.

##### **4.3.4.1 Cumulative Impacts**

The geographic area evaluated for hazardous waste cumulative impacts includes the City of Aurora. Hazardous waste cumulative impacts created through the Proposed Action

construction/demolition activities combined with off-base new construction and operation projects (within the City of Aurora and County of Arapahoe Comprehensive Plans [Arapahoe County, 2001]) would depend on the quantity and nature of the hazardous wastes generated. The quantity and the exact nature of the materials that would be generated on a cumulative basis are unknown. If appropriate BMPs and sound designs are employed, and adherence to all federal, state, and local regulations dealing with hazardous wastes are followed, no significant cumulative impacts related to hazardous wastes would be expected.

#### **4.3.5 Historic Structural Resources**

If in close enough proximity, ground disturbing activities under the Proposed Action could either directly affect potentially eligible buildings (Buildings 801 and 909) or their historic setting.

Ultimately, since no projects are located close to historic facilities, nor do they involve historic facilities, there would be no impacts to historic structural resources. If proposed building and/or facilities locations change such that impacts could occur to historic structural facilities, coordination between Buckley AFB and the SHPO would occur and appropriate measures would be taken to ensure cultural resources would be protected in compliance with Section 106 of the Historic Preservation Act.

##### **4.3.5.1 Cumulative Impacts**

The geographic area evaluated for cumulative impacts encompasses that portion of the City of Aurora within the boundary of local Historic Places. The City of Aurora has designated 15 local Historic Places dating from 1870 to 1946. These structures serve as a lasting resource for understanding the social, cultural and architectural history of the community (Figure 4.1).

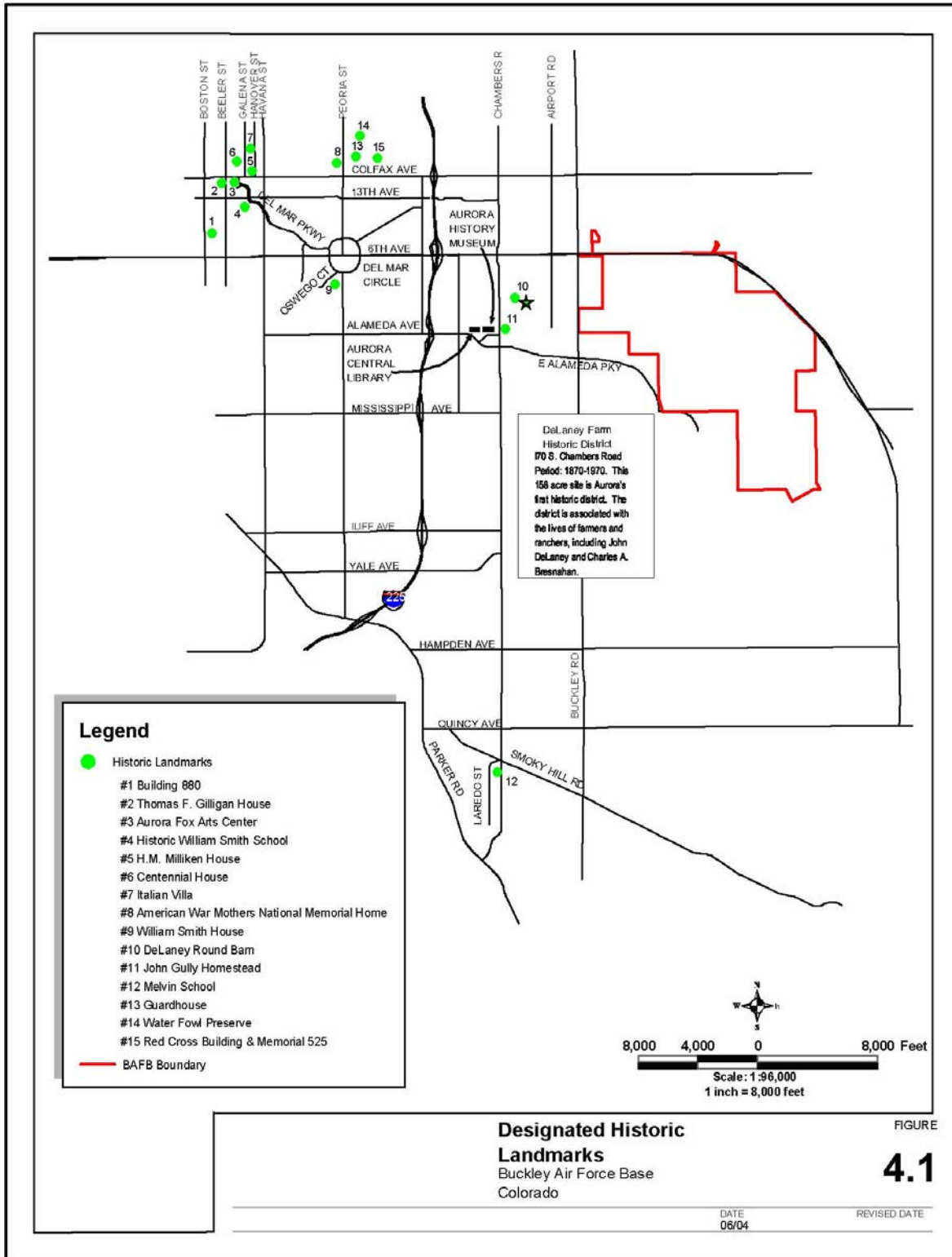
Table 4.10 lists the five City of Aurora Historic Places that are on the National Register.

Table 4.10: City of Aurora List of Historic Places*			
Resource	Address	County	Registration Date
Wilson, Blanche A., House	1671 Galena Street, Aurora	Adams	11/7/1996
DeLaney Barn	200 South Chambers Road, Aurora	Arapahoe	2/9/1989
Gully Homestead	200 South Chambers Road, Aurora	Arapahoe	1/9/1986
Melvin School	4950 South Laredo Street, Aurora	Arapahoe	1/5/1984
Smith, William, House	412 Oswego Court, Aurora	Arapahoe	9/26/1985

\* Source: Index by State and City report National Register of Historic Places; <http://www.cr.nps.gov/nr>.

Although none of these National Register properties represent historic military structures, four of the designated historic landmarks are World War I or II buildings. These buildings represent typical Army wartime construction and preserve the early architectural themes of a military guardhouse, a U.S. Army General Hospital, an American War Mothers service organization house, and an office/supply facility.





There would be no adverse impact to a historic structural resource whose conservation is necessary to fulfill specific purposes identified in the *Colorado Preservation 2005 Plan* (Colorado Historical Society 2001). Cultural and historic resources outside of Buckley AFB would not be affected by the Proposed Action. Less significant sites throughout the urban area could potentially be lost. While the loss of individual sites may not appear important, the collective loss of several sites would diminish the ability to appreciate and draw accurate conclusions about the record of people, both prehistoric and historic, in the region.

Cumulatively, Buckley AFB's structural cultural and historic resources would continue to derive appropriate protection within base boundaries. Buckley AFB activities would not affect cultural resources outside of the base. Impact intensities would vary by resource type and accessibility, and would range in intensity at individual sites from negligible to minor. Regionally, the cumulative effect on cultural resources would be negligible.

#### **4.3.6 Land Use and Aesthetics/Visual**

##### **4.3.6.1 Land Use**

Under the Proposed Action, conceptual planning boundaries were developed to consolidate and co-locate facilities with like or compatible land uses within the ADPs. Development projects within these areas would minimize health, safety and security risks by placing similar facilities in close proximity to one another and segregating incompatible facilities.

Ultimately, the development that would take place within these ADPs would improve organizational efficiencies, reduce travel distances and times, and potential exposure to hazards.

Travel distances and times would be reduced between residences, offices and public service areas through widening main thoroughfares, and demolishing and reconfiguring existing road systems. Transportation systems and accesses would interconnect with the City of Aurora's roads. Transportation improvements such as deceleration lanes, pedestrian/bicycle paths, streetscapes, and future street access to the MFH area would be compatible with the City of Aurora's Comprehensive Plan.

Consolidation of facilities with like or compatible uses within appropriate land use designations would reduce residential areas being exposed to excessive noise. Building

placement and height restrictions would remain compatible with USAF aircraft operations and designated clear zones.

Generally, planned land use for the entire area abutting Buckley AFB encourages the growth of high quality development that relates to and encourages close proximity with the base. These land uses are also compatible with the aircraft noise contours. USAF policy requires that all land within Clear Zones be owned or controlled by the installation. Two areas that are incompatible with Air Force Clear Zone restrictions are:

- A small portion of the Plains Conservation Center, south of the installation, located within the Clear Zone.
- The area east and south of the southeast corner of Buckley AFB falls within the APZs I and II (City of Aurora 1998).

Continuation of the positive working relationship between the City of Aurora, Arapahoe County, and Buckley AFB would ensure that appropriate land uses occur within the aircraft noise contours and adjacent lands.

#### **4.3.6.2 Aesthetics/Visual**

Much of the areas with impressive open space/view sheds with mountain views would be preserved as open space and developed with outdoor recreation facilities over time.

Design elements such as gateways, streetscapes and view shed enhancements have been incorporated into the ADP to ensure aesthetic compatibility. Scenic view sheds would be preserved to the maximum extent to enhance these future building sites.

The Proposed Action would provide scenic views, streetscapes, open space and landscape enhancements throughout the ADPs. Along the southwestern boundary of the Privatized Housing ADP residential development would be oriented to enhance views of the Front Range, Devils Head and Pikes Peak and parklands. Landscape corridors are planned along Aspen Street, Telluride Street, and Steamboat Avenue. Improved landscape areas, trees and shrubs are planned within all ADPs and some ELUAs and parking areas.

Part of the purpose of the Williams Lake Recreation ADP is to provide for outdoor recreation use and enjoyment of the lake and adjacent lands. Aesthetic enhancements are also provided by

the diversity of water-based and land-based recreational opportunities at Williams Lake. Although these enhancements would provide direct, short- and long-term beneficial improvements to aesthetics in the northeastern portion of the base, the overall impact of the Proposed Action is that the facility will continue to appear as a military installation (as viewed from off-base). However, since most new construction associated with the Proposed Action would be structures similar to typical urban development (building additions, construction of general buildings, warehouses, housing units, dormitories, etc.) or flat-featured (sports fields, playgrounds, runway and roadway improvements, parking lots, etc.), the incremental impact on visual aesthetics would not be considered significant.

Demolition projects will result in at least a temporary conversion of previously impervious surfaces returning to opened-soil conditions. It assumed that opened-soil areas created through demolition projects will naturally revert or be seeded and restored as mixed grass prairie areas. This may result in a minor positive impact on visual aesthetics. However, land use decisions may reclaim these for future development, so the positive impacts may be temporary.

#### **4.3.6.3 Cumulative Impacts**

According to the City of Aurora Comprehensive Plan, the Airport Influence District (AID), Noise Impact Districts, and Accident Potential Zones are located within the Buckley AFB Area Plan. These zones regulate development within lands affected by base air operations and are subject to additional Federal Aviation Administration building placement and height restrictions. All of the areas in Aurora immediately to the east of Buckley AFB are currently located within the Buckley Research and Development Subarea Zoning District. Under this zoning district, office, commercial, and industrial development is allowed. To preserve the base's flight operations, residential development is not designated under this zone.

The Arapahoe County Comprehensive Plan indicates that Buckley AFB is within the Urban Service Area and that adjacent land uses in Arapahoe County are planned for an Employment Center with open space designated along the riparian areas located within the Aurora E-470 Plan Area. Employment Centers include research and development, service and office centers, warehousing, light industrial and educational facilities. Current zoning maps show small areas

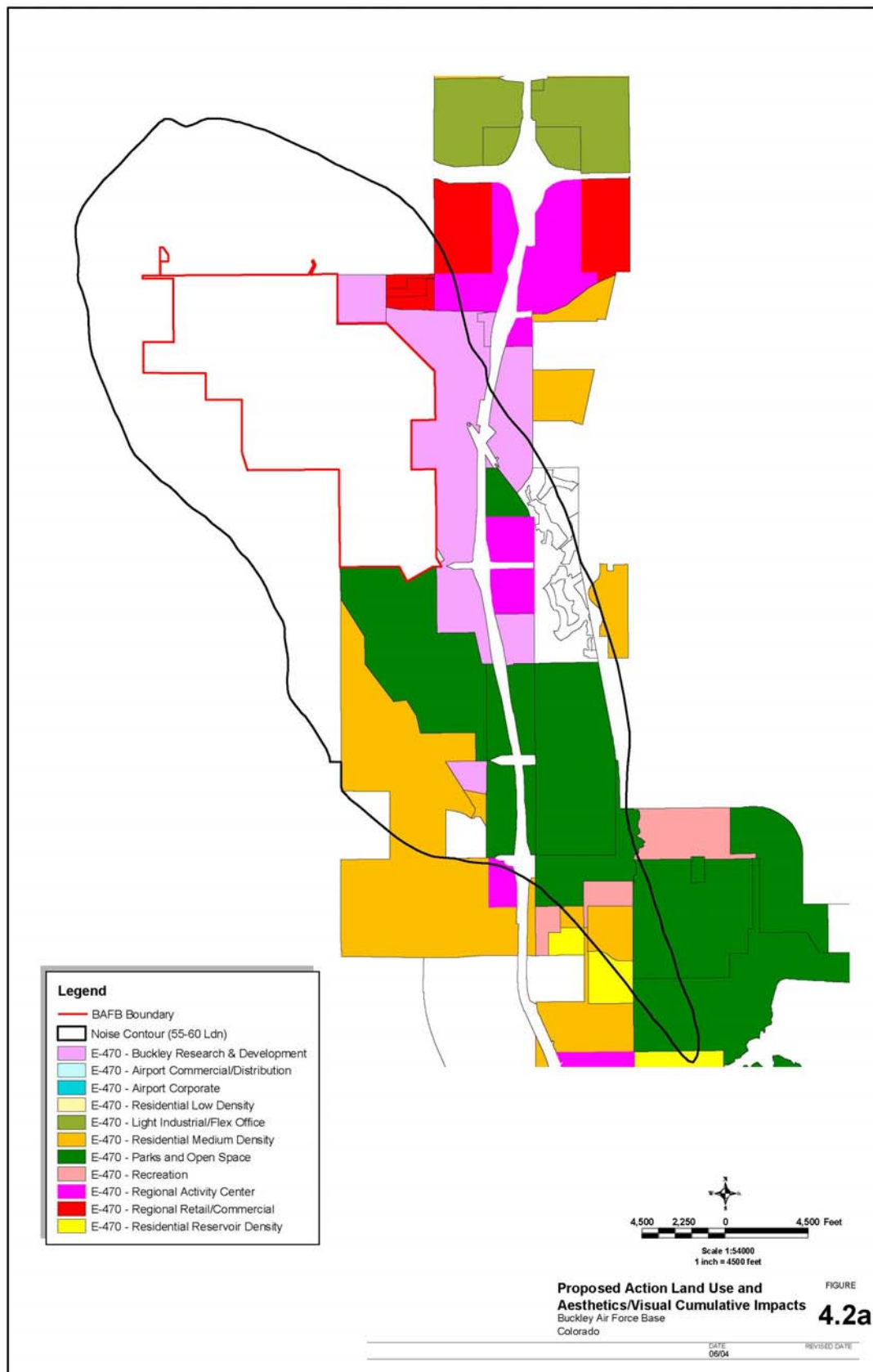
zoned for single family 1 dwelling unit per 19 acres and most remaining portions are zoned as light industrial.

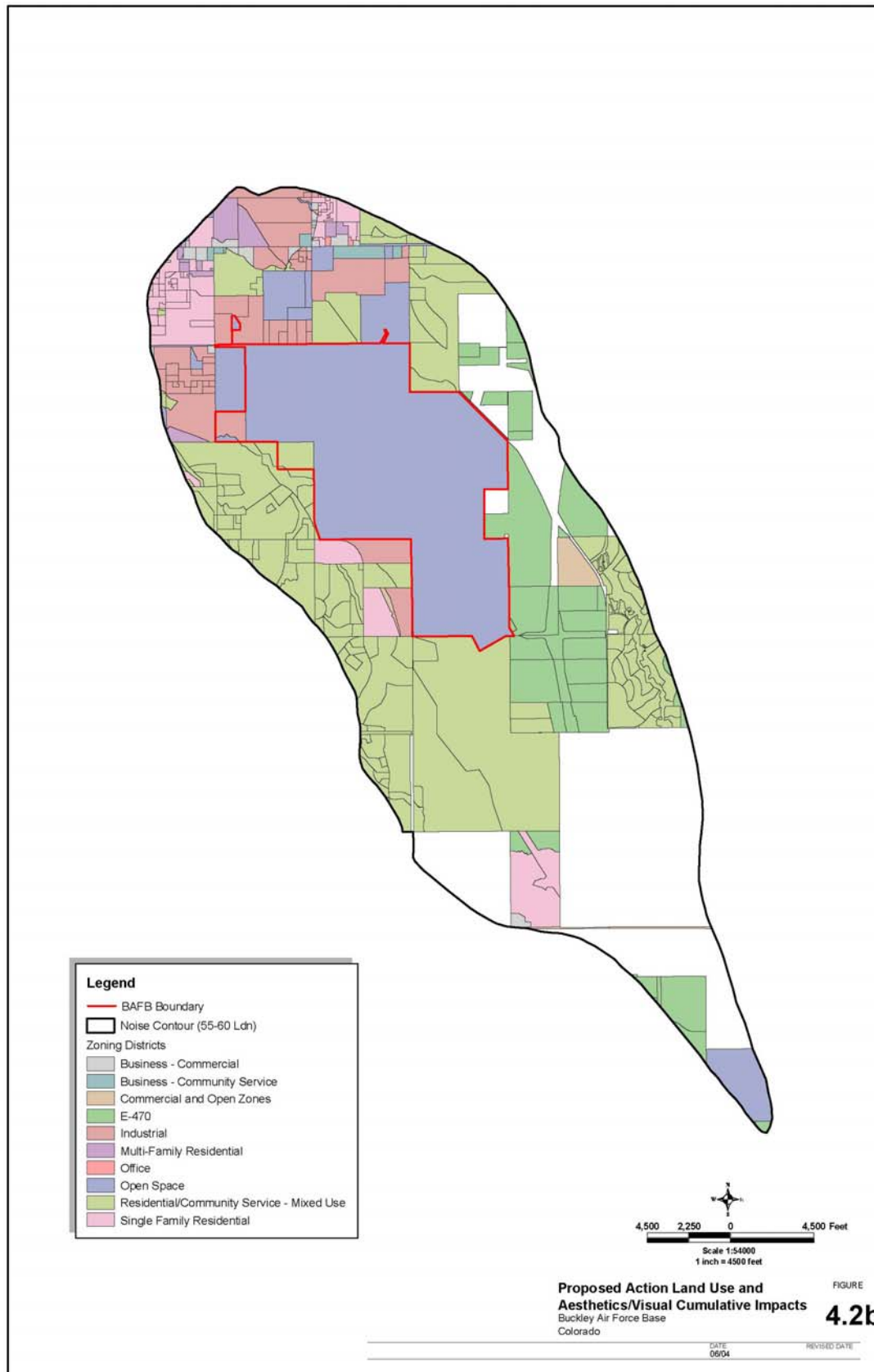
The geographic area evaluated for cumulative impacts encompasses all existing and proposed land uses located within the 75 dB DNL noise contours (Figures 4.2a and 4.2b), the north, west, and east transportation corridors and base access entries bordering Buckley AFB. The rationale for selecting the 75 dB DNL noise contour is that it provides an off-base intersect for noise generated at Buckley AFB. Existing land uses, landscapes and scenic views surrounding the base, and future land uses designated in the City of Aurora E-470 Plan Area, City of Aurora and County of Arapahoe Comprehensive Plans including subareas that border the base are located within the limits of this noise contour.

In the future, if several land units were to be annexed to the City of Aurora there would be increasing office and commercial development on the eastern boundary of Buckley AFB. These areas are designated in the E-470 Land Use Plan Map to be zoned as part of the Buckley Research and Development Subarea.

Residential or commercial development could occur on Buckley AFB's southwestern boundary thereby reducing the scenic views of the mountains from the Privatized Housing ADP. However, the location and number of open spaces, parks, streetscapes, and landscape improvements that are made both on-base and off-base and along transportation corridors would enhance the immediate landscape surrounding Buckley AFB.

An overall population increase between 450 and 640 personnel by 2010 would increase the pedestrian and vehicle traffic and use of base facilities. Increasing base population affects residential quality of life and recreational experience. The experience of on-base residents would be affected by the presence, density, and behavior of all other residents and base visitors. Undesirable activities such as vehicle speed, crowding at outdoor recreational facilities, and littering would continue. Increased pedestrian foot traffic could increase trampling and compact soils, affecting landscaped areas, and open, and recreational spaces. Noise from traffic and aircraft operations would continue to be heard.





### **4.3.7 Socioeconomics**

#### **4.3.7.1 Population**

The Military Active Duty population of Buckley AFB would increase from between 450 and 640 personnel by 2010 (not including Buckley Annex personnel). The total Wing and tenant installation population would increase from 12,844 to an approximate maximum of 13,494.

An increase in available rental units and the introduction of on-base family housing would occur. Together these changes would alter the socioeconomic dynamics and demographics of the local community and surrounding residential areas. The increase in available on-base housing could economically diversify the off-base residential areas. The increase of available rental and for-sale housing could influence the age distribution of surrounding residential areas. The shift in housing stock from dormitories to include on-base family housing would also change, making the on-base age distribution more consistent with the surrounding community.

#### **4.3.7.2 Employment and Income**

Construction would result in generally positive short-term impacts to employment, wages and income. Construction is estimated to generate about \$ 175.0 million over a five-year period (from 2003-2009) (Buckley AFB 2002a). Labor costs typically comprise approximately one-half of construction contract values. The Proposed Action would generate an estimated \$ 87.5 million in direct income. The Proposed Action would therefore generate approximately \$17.5 million in annual construction employment over the period of time that the CIP projects are completed. Direct project construction employment could indirectly increase the number of construction-related jobs in the surrounding area (estimated at approximately 622 jobs per year) to the extent that certain types of service jobs (such as materials, manufacturing or delivery) are created in order to support construction. Materials and supplies used to support the CIP, including lumber, cement, tools, and other products essential to complete construction, would be purchased within the DMA. Businesses selling construction materials would benefit through increased revenues and potential employment increased needed to meet the increased demand for goods and materials.

During periods of high construction activity, installation services could experience limited access to on-base community services. The construction activities could result in beneficial impacts, as construction workers may spend money both on and off-base while working at the



base, for items such as meals (breakfasts and lunches) and fuel (gasoline). These impacts would be temporary. Indirect beneficial impacts include improvement to the character of the installation such as street and landscaped open space, improved building conditions, and compatible architecture. These factors may contribute to a more economically diverse population and increased on-base spending for goods and services, as well as within the adjacent local community.

The proposed action could also contribute to economic development within the surrounding area, including building renovation/expansion, new construction and business start-ups. As a result, military dependents could enjoy increased employment opportunities in the surrounding community.

#### **4.3.7.3 Housing**

Housing costs in Arapahoe County are increasing. The average rental unit in Arapahoe County in the 4<sup>th</sup> Quarter of 2003 was \$ 786.54. The proposed action could reduce the demand for housing within the adjacent residential area. Reduced demand for housing could also level or reduce the rental rates and property taxes. This could improve the affordability for some residents of the surrounding community.

<b>Table 4.11: Planned Military Family Unit Types</b>	
<b>Unit Type</b>	<b>Number of Units</b>
2-Bedroom	0
3-Bedroom	320
4-Bedroom	31
Total	351

Redevelopment of the site through the proposed action would result in increases in both the number of administrative structures and housing units, changes in the facility type, and changes in the base resident population and demographics. The number of residential units on-base would increase from the current 236-person dormitory units to between 332 and 428 dormitory units. A more diverse mix of housing types would also result, with some single-family units, single-story units, and multi-family housing units. The post-development residential mix is

intended to address the needs of a range of household types including single officers and soldiers, couples without children, and those with families.

Relocation of off-base personnel to on-base housing could result in temporary or permanent stresses to their social activities and/or affiliations with the surrounding community. Relocation could for example, make it more difficult to maintain participation in community clubs, organizations, and religious institutions. Various factors including the physical distance involved, substitute opportunities on-base, and personal choice would influence whether these community ties are stressed or severed. Personnel permanently relocating to on-base housing could find it less convenient to maintain their current affiliations.

New and expanded on-base community service facilities would result in the creation of jobs to support the additional services. It is estimated that the employment would increase by at least 3,000 jobs (Buckley AFB 2002a). This number could increase as community services adjust to the increase in residential population and new facilities. Some installation maintenance functions would be reduced as housing management and individual homeowners would become responsible for maintenance of the military housing units. It is anticipated that the average on-base annual discretionary income would increase as a result of the shift from off-base to on-base housing. Increased discretionary income levels and increased spending could result in a positive impact on local area business revenues.

#### **4.3.7.4 Community Redevelopment**

The implementation of the Proposed Action is intended to transform Buckley AFB into a fully functioning installation with a quality work and living environment and provide personnel with a full range of support service facilities. Replacement of deteriorating infrastructure and demolished facilities both on-base and off-base (such as the Fitzsimons Redevelopment and other projects scheduled for off-base development as presented in Table 2.21a) would provide new work and recreational facilities, a variety of affordable housing options and encourage military personnel to remain in the local community. The local community would experience some short-term disruption due to on-base facility construction and relocation activity.

The CIP is consistent with the housing and community development objectives of the City of Aurora and Arapahoe County.

#### **4.3.7.5 Cumulative Impacts**

The geographic area evaluated for socioeconomic impacts includes the City of Aurora and Arapahoe County. The economic downturn has been more severe in the DMA (Arapahoe County and the City of Aurora are part of the DMA) than the national decline because of the heavy job losses in the telecommunications, high-technology, and tourism sectors. Recent economic improvements indicate economic recovery is underway.

The CDLE projects a 31.2 percent expected job growth from 2000-2010 in Colorado. This is a 9.5 percent decrease compared to the job growth from 1990–2000 (CDLE 2004). Of the nearly 726,600 new jobs projected for this period, 42 percent are anticipated in the Services sector growing at an average annual growth rate of 4.7 percent with an overall total employment share of 38 percent by 2010. With the Fitzsimons Redevelopment Area, the majority of new jobs in the local community would be in the education and health, and professional business services. In accordance with the projected capital investments within the City of Aurora, nearly half of the total construction-related economic effects would occur in the vicinity of I-225/University Campus Area by the end of 2010.

This potential increase in business development and in employment could create a decrease in unemployment within the immediate area. Many military personnel moving on-base are already employed, and would not add additional demand for employment among residents in the surrounding areas.

Fitzsimons Redevelopment projects would be completed or started at the same time that the CIP is being implemented at Buckley AFB. In both cases, existing office and housing units would be demolished and redeveloped at each location. An urban-centered residential/commercial complex scheduled to open in 2006 (at the center of the Fitzsimons square mile) will centralize 487 mid-rise residential units, restaurants and convenience retail amenities to serve the rapid scientific-entrepreneurial development. The potential cumulative impacts from the simultaneous development could involve a temporary decrease in available moderate to low-income rentals in the immediate area. Most previous military housing units within the area would be replaced with higher rent units. This would be off-set by the temporary increase in available rentals as military personnel shift to on-base housing.

## **4.3.8 Utilities**

### **4.3.8.1 Water Supply**

Several Proposed CIP EA projects involve the construction of buildings and other facilities (athletic fields) that would require permanent and continuous availability of water. In most cases, underground water supply lines would need to be run from existing laterals and mains and be connected to new structures. The distance water supply lines would need to be run would depend on the location of the proposed facility and the location of the nearest feasible tie-in to an existing water supply line.

Proposed CIP EA projects would require water for construction of buildings and other facilities. Water may be used for dust suppression at construction and demolition sites. Since most if not all Proposed CIP EA construction projects would include installation of bathrooms, and in some cases, kitchen facilities, operational water use would occur once the structures are completed and occupied. Water would also be used for landscaping irrigation and irrigation and maintenance of the athletic fields.

The increase in water use during construction and demolition activities for dust suppression would depend on the following factors:

- Duration and area of land disturbance
- Temperature
- Humidity
- Wind direction and speed
- Soil characteristics (size, density, moisture content), and
- Frequency, duration and volume of natural precipitation events.

Details of methods and techniques that can be employed to reduce the creation and migration of dust during the ground disturbance phase of construction and demolition activities were previously presented in Section 4.3.1.1. Estimates of increased water use can be made assuming that water suppression is the only technique practiced at construction and demolition sites. To make estimates the following assumptions were made:

- Water would be sprayed on exposed earth surfaces via water spray truck or through hoses with atomizing nozzles
- The duration of ground disturbance for construction projects and areas of disturbance are assumed to be the Project Ground Disturbance Duration and Total Land Disturbance values, as calculated and presented in Appendix B
- The duration of ground disturbance for demolition projects and areas of disturbance are assumed to be the Project Ground Disturbance Duration and Total Building Land Disturbance values, as calculated and presented in Appendix C, and
- Water is applied to exposed areas of disturbance at a rate of 500 gallons/acre/day. This value includes water applied to stockpiles and natural precipitation is not considered in the calculations.

The estimated increase in water use from the Proposed Action if water suppression is the only technique practiced at construction and demolition sites is shown on an annual and total basis on Table 4.12.

<b>Table 4.12: Construction and Demolition Water Suppression Consumption</b>			
<b>Year</b>	<b>Water Required for Construction Projects (Gallons)</b>	<b>Water Required for Demolition Projects (Gallons)</b>	<b>Total (Gallons)</b>
2002	2,952,859	0	2,952,859
2003	9,887,995	6,612	9,894,607
2004	6,859,062	18,539	6,877,601
2005	31,484,769	43,100	31,527,869
2006	4,247,738	53,994	4,301,732
2007	2,528,427	0	2,528,427
2008	6,213,939	18,926	6,232,865
2009	8,962,054	28,842	8,990,897
2010	690,834	506,198	1,197,033
TBD*	3,080,701	103,306	3,184,008
<b>Totals</b>	<b>76,908,378</b>	<b>779,518</b>	<b>77,687,896</b>

\* TBD = To Be Determined for projects scheduled beyond 2011 (year of completion currently unknown/unspecified).

Appendix E contains a tables presenting estimated water use for dust suppression associated with individual construction and demolition projects; ADPs and ELUA totals; and overall CIP totals.

Operational water use increases resulting from occupation of completed buildings can be estimated by assessing the increase in the number of individuals that would be present on the base as a result of implementing the Proposed Action. The following assumptions were made to calculate operational water use increases:

- Water use for persons living off-base (working on-base) is assumed to be 100 gallons per day, 260 days per year.
- Water use for persons living on-base (in New MFH and Dormitories) is assumed to be 100 gallons per day, 365 days per year.

The day-time base population would increase each year that construction projects are completed and new buildings are occupied and used for intended purposes. Table 4.13 shows the increase in water use on an annual and cumulative basis that would be created by implementation of the Proposed Action.

<b>Table 4.13: Finished Building Operational Water Consumption</b>		
<b>Year</b>	<b>Water Required for Human Consumption (Million Gallons)</b>	
	<b>Annual</b>	<b>Cumulative</b>
2002	1.067	1.067
2003	2.640	3.707
2004	3.649	7.356
2005	6.432	13.787
2006	1.362	15.150
2007	1.527	16.677
2008	0.973	17.650
2009	2.886	20.536
2010	0.180	20.716
TBD*	1.972	22.688
<b>Totals</b>	<b>22.688</b>	<b>22.688</b>

\* TBD = To Be Determined for projects scheduled beyond 2011 (year of completion currently unknown/unspecified).

Permanent water use increases would also result from landscaping irrigation and irrigation and maintenance of the athletic fields. To make water use increase estimates for irrigation the following assumptions were made:

- Landscaped and irrigated areas associated with buildings are 10 percent of the building size (square footage)
- The entire area of the athletic fields would be irrigated
- Irrigation would occur from April 1 through September 30 annually, for a total of 183 days
- Irrigation rates are 41,000 gallons/acre/week

- Irrigation rates for turf and landscaped areas are identical.

Using these assumptions annual and cumulative water use increases at Buckley AFB for irrigation purposes would be as provided below on Table 4.14.

<b>Table 4.14: Irrigation Water Consumption</b>			
<b>Year</b>	<b>Acreage Requiring Irrigation</b>	<b>Annual Water Required for Irrigation (Million Gallons)</b>	<b>Cumulative Water Required for Irrigation (Million Gallons)</b>
2002	0.464	0.498	0.498
2003	4.775	5.119	5.616
2004	0.898	0.963	6.579
2005	24.930	26.722	33.301
2006	0.547	0.586	33.887
2007	0.274	0.294	34.181
2008	0.640	0.686	34.867
2009	0.426	0.456	35.323
2010	0.076	0.081	35.404
TBD*	18.439	19.764	55.168
<b>Totals</b>	<b>51.470</b>	<b>55.168</b>	<b>55.168</b>

\* TBD = To Be Determined for projects scheduled beyond 2011 (year of completion currently unknown/unspecified).

As a result of implementing the Proposed Action, water use at Buckley AFB would increase in the short-term, due to construction/demolition activities. However, occupation and operation of completed facilities would create a long-term increase in annual water usage of 77.856 mgd (from 115.719 mgd in FY02 to a projected 193.575 mgd). The City of Aurora distributed a total of 13,580 mgd in 2003, a portion of which was distributed to Buckley AFB. After full implementation of the Proposed Action and using the 2003 distribution value, Buckley AFB water consumption would increase from 0.85 to 1.4 percent of the total water supplied by the City of Aurora in 2003 annually. The anticipated increase in water use resulting from implementing the Proposed Action would be considered a direct effect, and would create an insignificant impact on water supply.



#### **4.3.8.2 Wastewater Treatment**

Several Proposed CIP EA projects involve the construction of buildings and other facilities (athletic fields) that would include bathrooms and kitchens. These facilities would be provided with continuous water supply and would also require sanitary sewer disposal connections. As with water supply connections, underground sewer lines would need to be run from new structures and be connected to existing laterals and mains. The distance sewer lines would need to be run would depend on the location of the proposed facility and the location of the nearest feasible tie-in to an existing sewer line.

Proposed CIP EA projects would not be expected to generate significant quantities of wastewater though construction and demolition of buildings and other facilities. Contractors are typically required to supply self-contained portable sanitary facilities for on-site workers and have the wastes generated pumped out and treated off-site.

As with water use, operational wastewater generation resulting from occupation of completed buildings (bathroom and kitchen facilities) can be estimated by assessing the increase in the number of individuals that would be present on the base as a result of implementing the Proposed Action. The day-time base population would increase by a total maximum of 640 individuals. A conservative assumption would be that 100 percent of the water consumed would be discharged as wastewater. Under this assumption, wastewater generation and discharges would increase by 22.688 mgd (or 0.06 mgd), as calculated above in Section 4.3.8.1 occupation of completed facilities would create a long-term increase in annual wastewater generation. This would increase the wastewater discharge from Buckley AFB from 511 to 534 mgd (or 1.46 mgd), a 4.5 percent increase. After full implementation of the Proposed Action Buckley AFB wastewater discharges would increase from 0.76 to 0.79 percent of the total Metro Wastewater Reclamation District treatment plant capacity. In addition, since the Metro Wastewater Reclamation District treatment plant was designed to meet population estimates through 2010, the anticipated increase in wastewater generation and discharge resulting from implementing the Proposed Action would be considered a direct effect, and would create a negligible impact on wastewater treatment.

Buckley AFB's Wastewater Contribution Permit requires notification to the Metro Wastewater Reclamation District of the introduction of any new wastewater constituents or any substantial changes in operations or the volume or character of the wastewater constituents being

discharged. The Metro Wastewater Reclamation District may require that the permit be modified to address new and/or changing discharges associated with the Proposed Action. In particular, the Metro Wastewater Reclamation District will need to be notified of new and/or changing discharges and may require modifications to the permit resulting from the following new or modified facilities:

- Entomology Shop
- HAZMAT Pharmacy
- Hazardous Waste Building
- Consolidated Fuels Storage
- H-70 (Hydrazine) Fuel Storage.

#### **4.3.8.3 Solid Waste**

Solid waste generation would increase due to both construction and demolition projects as well as operations of new facilities. Demolition of buildings and other structures would generate considerable amounts of solid waste, as buildings, roofs, interior walls and permanently installed contents (integrated storage units, lockers, cabinets, kitchen and bathroom fixtures, etc.) would be demolished and need to be handled appropriately as solid wastes. In addition, construction projects would generate wastes through packaging of materials delivered to and used on the site, excess and unusable materials resulting from construction activities, and general trash and debris associated with construction projects. Typically, contractors are required to arrange for solid waste disposal within contracts written and issued for the work.

Recycling of discarded construction and demolition materials should be considered within the scope of the Proposed Action. Materials that may be recycled include metal, wood, concrete, and asphalt (paving and roofing tiles).

Although recycling should be considered and implemented to the extent possible, for the purposes of this EA the volume of solid waste generated as a result of the Proposed Action would be calculated and assumed to be disposed of at a permitted solid waste landfill. The exact nature and quantity of solid wastes that would be generated through construction and demolition activities is not known. However, demolition waste volumes can be estimated by considering the

size of the building or structure. The demolished structure itself, as well as roofs, interior walls, permanently installed contents (integrated storage units, lockers, cabinets, kitchen and bathroom fixtures, etc.), foundations, sub-base materials, side walks, and parking lots would all create solid wastes. As built drawings were obtained and consulted and site inspections were conducted to gather the appropriate information to make accurate solid waste generation estimates for demolition projects. Wastes generated during construction activities would be limited to materials used to create forms for building foundations and footers, packaging wastes (associated with internal building components (windows, doors, boilers, hot water heaters and other interior features), and other general debris. Solid waste generation for construction projects were based on waste expected to be generated during construction activities and using a conservative engineering estimate of 500 lbs of solid waste generated per day of ground disturbance construction activity. Solid waste generation estimates from Proposed Action construction and demolition activities would total 641,058 tons. The table contained in Appendix F shows estimated construction and demolition solid waste generation resulting from the Proposed Action. The appendix includes waste generation estimates associated with individual construction and demolition projects; ADPs and ELUA totals; overall CIP totals; and assumptions made to support the calculations. Due to proximity and to limit construction and demolition costs, it is likely and assumed that the solid wastes generated through contractor activities would be disposed of at the Denver-Arapahoe Disposal Site. Table 4.15 shows the solid waste generation estimates on an annual basis and the corresponding percent of total waste received at the Denver-Arapahoe Disposal Site landfill.

<b>Table 4.15: Construction and Demolition Waste Generation – Proposed Action</b>		
<b>Year</b>	<b>Construction and Demolition Solid Waste Generation (Tons)</b>	<b>Percent of Total Waste Received by Denver-Arapahoe Disposal Site Landfill</b>
2002	143	0.01%
2003	20,065	0.88%
2004	44,575	1.96%
2005	47,839	2.10%
2006	123,016	5.40%
2007		

266

0.01%

<b>Table 4.15: Construction and Demolition Waste Generation – Proposed Action</b>		
<b>Year</b>	<b>Construction and Demolition Solid Waste Generation (Tons)</b>	<b>Percent of Total Waste Received by Denver-Arapahoe Disposal Site Landfill</b>
2008	33,569	1.47%
2009	126,809	5.56%
2010	174,159	7.64%
TBD <sup>(1)</sup>	70,618	3.10%
<b>Totals</b>	<b>641,058</b>	<b>28.12%</b>

- (1) Assumes the Denver-Arapahoe Disposal Site landfill receives 2,280,000 tons of solid waste per year.  
(2) TBD = To Be Determined for projects scheduled beyond 2011 (year of completion currently unknown/unspecified).

Once complete, most if not all Proposed CIP EA construction projects would be occupied or used by individuals. Solid wastes would be generated through operation of the facilities and would include general household-type trash and some medical wastes from the expanded Clinic. Waste containers would be provided at the facilities for collection of solid wastes. Wastes collected at new facilities would be handled by the existing private contractor and be disposed of at the Denver-Arapahoe Disposal Site.

As with water use and wastewater generation, solid waste generation resulting from occupation of completed buildings can be estimated by assessing the increase in the number of individuals that would be present on the base as a result of implementing the Proposed Action. The day-time base population would increase by a total maximum of between 450 and 640 individuals. Of this number, it is assumed that 10 percent of the new personnel would be onsite 260 days per year, and 90 percent would be on-base 365 days per year (individuals living on-base in MFH and Dormitories). Assuming waste generation rates of 5 and 15 pounds of solid waste per person per day for off-base and on-base individuals, respectively, solid waste generation and disposal would increase by 8,868 lbs per day. This value equals 1,618 tons of solid waste per year. Occupation of completed facilities would create a modest long-term increase in annual solid waste generation. As a result of implementing the Proposed Action, solid waste generation at Buckley AFB would increase by approximately 641,058 tons in the short-term, due to construction/demolition activities. Occupation and operation of completed

facilities would create a long-term increase in annual waste generation of 1,618 tons per year (from 2,950 tons per year in FY04 to a projected 4,943 tons per year), which would increase the percent of the total waste sent by Buckley AFB to the Denver-Arapahoe Disposal Site landfill from 0.13 to 0.22 percent of the total received by the landfill. The anticipated increase in solid waste generation resulting from implementing the Proposed Action would be considered a direct effect, and would create a moderate impact on landfills (the Denver-Arapahoe Disposal Site) and recycling facilities receiving the waste.

#### **4.3.8.4 Electricity**

Several CIP EA projects involve the construction of buildings and other facilities (athletic fields) that would require permanent and continuous availability of electricity. In most cases, overhead or underground electrical supply lines would need to be run from existing distribution lines and be connected to new facilities. The distance electrical lines would need to be run would depend on the location of the proposed facility and the location of the nearest feasible tie-in to existing supplies. In order to minimize potential environmental impacts (area of ground disturbance, fugitive dust and combustion emissions, etc.) from trenching activities, efforts to run multiple utilities needed for new structures and facilities in common trenches should be made.

Some electricity use increases would be expected from construction and demolition actions related to the Proposed CIP EA projects. However, since most contractor equipment would be operated on gasoline and diesel powered engines, including small generators used to generate electricity on job sites, increases in electrical consumption would be negligible. Upon completion, operation of the facilities would cause increases in electric use. Increased electrical demands expected from operation of completed facilities would include operation of HVAC equipment, communication equipment, computers, security systems, appliances, and general building and facility lighting. The increase in electrical use can be estimated on the basis of new building areas. Currently, Buckley AFB installation facilities consist of approximately 2.6 million gross ft<sup>2</sup>. The Proposed Action would approximately add an additional 1.9 million ft<sup>2</sup> (approximately) of building area. Assuming a direct ratio of building areas to electrical use, the Proposed Action would result in an increase in electrical use of approximately 76,477,758 kWh per year, or an increase of approximately 69 percent. The increase in electrical use from

construction/demolition and operation of completed buildings and facilities associated with the Proposed Action would be considered a direct effect, and would be considered moderate.

#### **4.3.8.5 Natural Gas**

Several Proposed CIP EA projects involve the construction of buildings and other facilities (in the future, the athletic fields will be provided with a concessions stand that will require a natural gas supply) that would require permanent and continuous availability of natural gas. In most cases, underground natural gas supply lines would need to be run from existing lateral and main tie-ins and be connected to new facilities. The distance natural gas lines would need to be run would depend on the location of the proposed facility and the location of the nearest feasible tie-in to an existing natural gas supply.

As with electricity use, moderate increases in natural gas consumption would be expected from construction and demolition actions. More substantial increases in natural gas use would result from occupation and use of completed facilities. Primarily, increased natural gas use would result from operation of HVAC equipment and hot water heaters in new buildings. The increase in natural gas use can be estimated on the basis of new building areas. Using the building area values and assumptions employed for estimating increased electrical use, the Proposed Action would increase natural gas use by an additional 103 mmft<sup>3</sup> per year, or an increase of approximately 69 percent. The increase in natural gas use from operation of completed buildings associated with the Proposed Action would be considered direct effects, and would be considered moderate.

#### **4.3.8.6 Cumulative Impacts**

The geographic area evaluated for cumulative impacts on utilities includes the City of Aurora. Cumulative impacts on utilities (water supply; wastewater treatment; solid waste generation; and electricity and gas consumption) would be created by the Proposed Action in combination with the increased utilities consumption and discharges resulting from other development in the vicinity of Buckley AFB. The City of Aurora anticipates development of residential areas at approximately 1,800 new residential units per year (Buckley AFB, 2002a). Assuming the new residential units average 2,000 ft<sup>2</sup> per unit, the growth rate would equal approximately 3.6 million ft<sup>2</sup> of building space per year. Office and industrial development is also projected to grow at a rate of 210 acres (9,147,600 ft<sup>2</sup>) annually (Buckley AFB, 2002a). Retail and

commercial development would comprise approximately 20 acres per year (871,200 ft<sup>2</sup>) (Buckley AFB, 2002a).

### Water Supply

Water consumed by new business, office, industrial, retail, and commercial buildings would depend on their size, number of employees, nature of operations, products produced, etc. Since these details are not known the following conservative engineering assumptions were applied:

- Three (3) individuals would live in each residential unit constructed in the City of Aurora (MACTEC, 2004c).
- Residential water consumption rates are 100 gallons per person per day (MACTEC, 2004d).
- Business Office and Industrial buildings average 200,000 ft<sup>2</sup> per facility (MACTEC, 2004c).
- Business Office and Industrial facility water consumption rates are 40,000 gallons per facility per day.
- Retail and Commercial buildings average 50,000 ft<sup>2</sup> per facility (MACTEC, 2004c).
- Retail and Commercial facility water consumption rates are 1,500 gallons per facility per day.

Table 4.16 shows the cumulative water consumption increases.

<b>Table 4.16: Cumulative Water Consumption</b>			
<b>Year</b>	<b>Buckley AFB Cumulative Water Increase (Million Gallons)<sup>(1)</sup></b>	<b>City of Aurora Construction Water Increase (Million Gallons)<sup>(2)</sup></b>	<b>Total Cumulative Water Increase (Million Gallons)</b>
2002	5	842	846
2003	18	1,743	1,761
2004	11	2,614	2,626
2005	65	3,486	3,550
2006	6	4,357	4,363
2007	4	5,229	5,233
2008	8	6,100	6,108
2009	12	6,972	6,984

<b>Table 4.16: Cumulative Water Consumption</b>			
<b>Year</b>	<b>Buckley AFB Cumulative Water Increase (Million Gallons)<sup>(1)</sup></b>	<b>City of Aurora Construction Water Increase (Million Gallons)<sup>(2)</sup></b>	<b>Total Cumulative Water Increase (Million Gallons)</b>
2010	1	7,843	7,844
TBD <sup>(3)</sup>	25	8,714	8,739

- (1) Buckley AFB water consumption values include water required for Proposed Action construction and demolition activities; building and residential unit operations; and landscaping and lawn irrigation.
- (2) Assumptions related to City of Aurora development and increased water consumption are as follows:
- City of Aurora Residential Growth Rate = 1,800 units per year
  - Average Residential Size = 2,000 ft<sup>2</sup> per unit
  - Number of Inhabitants per Residential Unit = 3 persons per unit
  - City of Aurora Business Office and Industrial Growth Rate = 9,147,600 ft<sup>2</sup> per year
  - Occupancy of Business Office and Industrial Development = 1,000 ft<sup>2</sup> per individual
  - City of Aurora Retail and Commercial Growth Rate = 871,200 ft<sup>2</sup> per year
  - Occupancy of Retail and Commercial Development = 481 ft<sup>2</sup> per individual.
- (3) TBD = To Be Determined for projects scheduled beyond 2011 (year of completion currently unknown/unspecified).

Cumulative impacts of increased water use would reach a maximum in the years following 2010, when the majority of the Buckley AFB Proposed Action construction and demolition projects are completed, requiring an additional 8,739 mgd. Following the completion of all construction and demolition projects, the cumulative annual water use increase would decrease marginally since no water would be used for dust suppression related to these activities. The cumulative water use increases would require the City of Aurora to increase water treatment and distribution capacity by approximately 64 percent (from current output of 13,580 mgd in 2003 to 22,319 mgd).

The City of Aurora CIP projected water demand increases up to 82,457 acre-feet in 2010 (City of Aurora, 1998). This value equals 26,870 mgd. The City of Aurora has budgeted to expand existing and construct new water infrastructure facilities (including reservoirs, treatment plants and distribution networks) to meet the anticipated demand increases. Cumulative impacts on water supply created by implementing the Proposed Action at Buckley AFB in concert with planned City of Aurora expansion would be met by expanding existing and constructing new water infrastructure facilities, and would therefore not be considered significant.



### **Wastewater Treatment**

Cumulative wastewater generation increases would be proportionate with water use increases. The Metro Wastewater Reclamation District provides wholesale wastewater transmission and treatment service to 58 local governments in the DMA, including the City of Aurora, and is currently treating approximately 160 mgd. If all cumulative increases in water use, with the exception of irrigation water, are assumed to be discharged and require treatment as a result of implementing the Proposed Action at Buckley AFB in combination with planned City of Aurora expansion, wastewater discharged to the Metro Wastewater Reclamation District would increase by approximately 8,738 mgy or 23.9 mgd. Since the Metro Wastewater Reclamation District treatment plant is designed to meet population growth estimates through 2010, with a hydraulic capacity of 185 mgd, and the cumulative impacts would increase wastewater treatment demands only to 183.9 mgd, the wastewater treatment impacts would not be considered significant.

### **Solid Waste**

Cumulative solid waste generation estimates can be made using the following assumptions:

- Three (3) individuals would live in each residential unit constructed in the City of Aurora.
- Residential waste generation rates 15 lbs per person per day.
- Business Office and Industrial facility waste generation rates are 60 lbs per 1,000 ft<sup>2</sup> building area per day.
- Retail and Commercial facility waste generation rates are 40 lbs per 1,000 ft<sup>2</sup> building area per day.

Table 4.17 shows the cumulative solid waste generation increases.

<b>Table 4.17: Cumulative Solid Waste Generation</b>			
<b>Year</b>	<b>Buckley AFB Cumulative Solid Waste Generation Increase (Tons)<sup>(1)</sup></b>	<b>City of Aurora Construction Solid Waste Generation Increase (Tons)<sup>(2)</sup></b>	<b>Total Cumulative Solid Waste Generation Increase (Tons)</b>
2002	1,761	110,632	112,394
2003	21,683	261,105	282,788
2004	46,194	391,657	437,851
2005	49,457	522,210	571,667
2006	124,634	652,762	777,397
2007	1,884	783,315	785,199
2008	35,187	913,867	949,054
2009	128,428	1,044,420	1,172,847
2010	175,777	1,174,972	1,350,749
TBD <sup>(3)</sup>	72,237	1,305,525	1,377,761

- (1) Buckley AFB solid waste generation values include wastes generated through Proposed Action construction and demolition activities and building and residential unit operations.
- (2) Assumptions related to City of Aurora development and increased solid waste generation are as follows:
- City of Aurora Residential Growth Rate = 1,800 units per year
  - Average Residential Size = 2,000 ft<sup>2</sup> per unit
  - Number of Inhabitants per Residential Unit = 3 persons per unit
  - City of Aurora Business Office and Industrial Growth Rate = 9,147,600 ft<sup>2</sup> per year
  - Occupancy of Business Office and Industrial Development = 1,000 ft<sup>2</sup> per individual
  - City of Aurora Retail and Commercial Growth Rate = 871,200 ft<sup>2</sup> per year
  - Occupancy of Retail and Commercial Development = 481 ft<sup>2</sup> per individual.
- (3) TBD = To Be Determined for projects scheduled beyond 2011 (year of completion currently unknown/unspecified).

Cumulative impacts of increased solid waste generation would reach a maximum in the years following 2010, when the majority of the Buckley AFB Proposed Action construction and demolition projects are completed, generating an additional 1,377,761 tons of waste per year. Following the completion of all construction and demolition projects, the cumulative annual solid waste generation rate would decrease to 1,305,524 tons of waste per year, since wastes from construction and demolition activities would not be generated at Buckley AFB. The cumulative solid waste generation increase would increase the waste volume sent to the Denver-

Arapahoe Disposal Site landfill by 60.4 percent in the maximum year, and 57.3 percent once all construction and demolition projects are completed.

The Denver-Arapahoe Disposal Site landfill is designed with an estimated life-span of 40 to 50 years. Cumulative solid waste generation impacts created by implementing the Proposed Action at Buckley AFB in concert with planned City of Aurora expansion would be met by the existing life-span and capacity of the landfill and, therefore would not be considered significant.

### **Electricity and Natural Gas**

The increase in electricity demand resulting from implementation of the Proposed Action would be 81,091,332 kWh per year, for a total annual consumption rate of 192,600,452 kWh. Full implementation of the Proposed Action would create an increase in natural gas demand of 111 mmft<sup>3</sup> per year, for a total annual consumption rate of 263 mmft<sup>3</sup>. Predicting increases in electricity and natural gas demands from anticipated City of Aurora development is difficult. These predictions for residential housing development are possible. Predictions for business offices, industrial, retail and commercial facilities is more challenging because it is difficult to predict the use and functions that would take place in these facilities. For example, a warehouse of a certain size would require a relatively minimal amount of electricity and natural gas when compared to an equal sized manufacturing facility, with high-energy demand equipment and machinery operating. For the purposes of this EA increases in electricity and natural gas demands from anticipated City of Aurora development will be estimated using 45 kWh and 50 ft<sup>3</sup> per ft<sup>2</sup> new construction per year, respectively for all building types. Using these assumptions annual cumulative increases in electricity and natural gas are shown below on Table 4.18 and 4.19.

<b>Table 4.18: Cumulative Electrical Demand Increases</b>			
<b>Year</b>	<b>Buckley AFB Electrical Demand Increase (kWh)</b>	<b>City of Aurora Construction Electrical Demand Increase (kWh)<sup>(1)</sup></b>	<b>Total Cumulative Electrical Demand Increase (kWh)</b>
2002	3,813,581	612,846,000	616,659,581
2003	9,435,590	1,471,284,000	1,480,719,590
2004	13,041,874	2,206,926,000	2,219,967,874
2005	22,988,152	2,942,568,000	2,965,556,152
2006	4,869,350	3,678,210,000	3,683,079,350
2007	5,458,937	4,413,852,000	4,419,310,937
2008	3,477,815	5,149,494,000	5,152,971,815
2009	10,315,614	5,885,136,000	5,895,451,614
2010	643,189	6,620,778,000	6,621,421,189
TBD <sup>(2)</sup>	7,047,229	7,356,420,000	7,363,467,229
<b>Totals</b>	<b>81,091,332</b>	<b>40,337,514,000</b>	<b>40,418,605,332</b>

(1) Assumptions related to City of Aurora development and increased electrical demand are as follows:

- City of Aurora Residential Growth Rate = 1,800 units per year
- Average Residential Size = 2,000 ft<sup>2</sup> per unit
- City of Aurora Business Office and Industrial Growth Rate = 9,147,600 ft<sup>2</sup> per year
- City of Aurora Retail and Commercial Growth Rate = 871,200 ft<sup>2</sup> per year.

(2) TBD = To Be Determined for projects scheduled beyond 2011 (year of completion currently unknown/unspecified).

<b>Table 4.19: Cumulative Natural Gas Demand Increases</b>			
<b>Year</b>	<b>Buckley AFB Natural Gas Demand Increase (mmft<sup>3</sup>)</b>	<b>City of Aurora Construction Natural Gas Demand Increase (mmft<sup>3</sup>)</b>	<b>Total Cumulative Natural Gas Demand Increase (mmft<sup>3</sup>)</b>
2002	5	681	686
2003	13	1,635	1,648
2004	18	2,452	2,470
2005	31	3,270	3,301
2006	7	4,087	4,094
2007	7	4,904	4,912

<b>Table 4.19: Cumulative Natural Gas Demand Increases</b>			
<b>Year</b>	<b>Buckley AFB Natural Gas Demand Increase (mmft<sup>3</sup>)</b>	<b>City of Aurora Construction Natural Gas Demand Increase (mmft<sup>3</sup>)</b>	<b>Total Cumulative Natural Gas Demand Increase (mmft<sup>3</sup>)</b>
2008	5	5,722	5,726
2009	14	6,539	6,553
2010	1	7,356	7,357
TBD*	10	8,174	8,183
<b>Total</b>	<b>111</b>	<b>44,819</b>	<b>44,930</b>

- (1) Assumptions related to City of Aurora development and increased natural gas consumption are as follows:
- City of Aurora Residential Growth Rate = 1,800 units per year
  - Average Residential Size = 2,000 ft<sup>2</sup> per unit
  - City of Aurora Business Office and Industrial Growth Rate = 9,147,600 ft<sup>2</sup> per year
  - City of Aurora Retail and Commercial Growth Rate = 871,200 ft<sup>2</sup> per year.
- (2) TBD = To Be Determined for projects scheduled beyond 2011 (year of completion currently unknown/unspecified).

Cumulative impacts of increased electricity and natural gas demands would reach a maximum in the years following 2010, when the majority of the Buckley AFB CIP EA Proposed Action construction and demolition projects are completed, increasing demands by 7,363,467,229 kWh and 8,183 mmft<sup>3</sup> per year for electricity and natural gas, respectively. Additional construction and demolition projects are programmed beyond FY10 are not specifically addressed in this EA because their proposed construction years have not been determined. However, the information that was available was consolidated under to be determined projects.

Water supply and wastewater treatment are services provided by government-owned utilities. Solid waste management is conducted by Waste Management, who operate the Denver-Arapahoe Disposal Site under a long-term contract arranged with the City and County of Denver. Electricity and natural gas are provided by non-governmental, independent industries. These industries forecast and increase supplies in direct response to consumer demand. The suppliers of electricity and natural gas would increase production and supply of those resources as the cumulative consumer demand increases. Cumulative electricity and natural gas demand impacts created by implementing the Proposed Action at Buckley AFB in concert with planned City of

Aurora expansion would be met by the suppliers increasing supplies, and therefore, would not be considered significant.

#### **4.3.9 Biological Resources**

##### **4.3.9.1 Plant Communities**

Impacts to plant communities result primarily from the loss of habitat to plant biomass due to clearing the construction envelope, a land surface area typically equal to twice the square footage of the constructed facility. Land clearing activities conducted prior to construction would create a direct effect on plant communities. Table 3.10 lists the estimated size of the construction envelope and the total acreage of each affected plant community that would be impacted or lost due to the Proposed Action construction projects. The Proposed Action would result in the disturbance of approximately 636 acres of land at Buckley AFB. This acreage consists of a total of 71 acres of mixed grass prairie, 495 acres of crested wheatgrass prairie, 44 acres of ornamental trees and shrubs, and 26 acres of weedy forbs. Residual, but disturbed acreage that is not landscaped would be reseeded to restore the existing site-specific community, thus minimizing the loss of existing vegetation. The total disturbance is equal to 15.0 percent of the total installation area, and would create a substantial, long-term impact on the vegetation. A positive impact would accrue from several demolition projects, including four projects in the Marine Compound area, resulting in approximately 14 acres increase in mixed grass prairie. As a result, the net loss of mixed grass prairie, crested wheatgrass prairie, ornamental trees and shrubs, and weedy forbs would be 622 acres, creating a moderate, insignificant impact on plant communities.

##### **4.3.9.2 Noxious Weeds**

Stands of noxious weeds can result from the invasion of disturbed ground by aggressive, non-native plants. The Proposed Action construction projects would result in a total ground disturbance of 636 acres over a 9 year period which could be invaded by invasive and noxious and other weed species if efforts to re-vegetate disturbed areas with desired plant species do not closely follow construction. Primary actions that can be taken to thwart establishment of invasive and noxious weeds at project construction sites include the following BMPs:

- Application of a broad-leaf herbicide immediately following construction.

- Timely reseeding of construction sites with sterile oats or winter wheat.
- Follow herbicide treatment with planting of rapid growing sterile annual grass, such as sterile oats or winter wheat, to establish root mass and compete with weeds.
- Follow sterile oats or winter wheat with mixed grass prairie seeding.
- Augment native grass in following growing season as needed.

The above BMP would result in short-term, minor impacts from noxious weeds.

#### **4.3.9.3 Wildlife**

The Proposed Action would result in a mosaic of short-term animal displacements from a group of sites constructed in each FY. The protracted construction process for all CIP projects rolled-up over the 9 year life of the CIP would result in loss/displacement of animals from 636 acres. A small number of small mammal mortalities would occur due to the excavation of areas used by burrowing animals. Likewise a small number of ground-nesting bird nests, particularly western meadowlark, would be lost and pairs displaced for the breeding season following ground clearing. A very small number of reptiles would likely be lost, again due to subterranean excavation. The greatest impact to a vertebrate population would be the black-tailed prairie dog community and is discussed in Section 4.3.9.4 below.

A positive impact would accrue from several demolition projects, including four projects in the Marine Compound area, resulting in approximately 14 acres increase in mixed grass prairie. However, a long-term impact due to overall net habitat loss would result from the Proposed Action. The loss of small mammal habitat would result in a minor adverse impact on several small animal populations as well as on vertebrate predators (small/medium mammal predators, raptors and raptorial passerines (loggerhead shrike).

#### **4.3.9.4 Threatened/Endangered Species And Species Of Special Concern**

Six rare species and two rare plant communities are known to inhabit, potential exist or visit Buckley AFB. Two of these species, the black-tailed prairie dog, a state Species of Special Concern, and the burrowing owl, a state Threatened species occur or, in the case of the burrowing owl, are likely to occur, at all eight ADPs and the Airfield/Aircraft Pavement, 6<sup>th</sup> Avenue, and Special Operation ELUA project sites.

It is estimated that a maximum of approximately 184 acres or 62 percent of the Buckley AFB black-tailed prairie dogs colony would be relocated or removed as a result of the Proposed Action. This constitutes a relatively large, incremental, adverse impact to the black-tailed prairie dog/burrowing owl resource at Buckley AFB. In addition it should be noted that a variety of other species including desert cottontail, horned lark, prairie rattlesnake, several species of mice, and carnivores and raptors including red-tailed hawk, Swainson's hawk, bald eagle, great horned owl, coyote, red fox, and long-tailed weasel would be negatively impacted by loss of black-tailed prairie dog acreage at Buckley AFB. Where black-tailed prairie dogs occur they would be removed per the Supplement to the EA of Proposed Prairie Dog Management Plan at Buckley AFB (Prairie Dog Supplement), or destroyed by lethal means prior to the start of ground disturbance. The black-tailed prairie dog is no longer considered a candidate species for listing as threatened; therefore, this EA considers the impacts of using lethal means. Live-trapped animals would be transferred to the USFWS black-footed ferret facility, local raptor rehabilitation facilities, relocation areas, or other beneficial uses as opportunities and approved management techniques per the Prairie Dog Supplement.

A survey for burrowing owls would be performed prior to any black-tailed prairie dog control action or the start of ground disturbance if site clearing is to occur during the owls' summer residence at the installation (March – October) (Jones, 1998). Site clearing activities from November through mid-March can occur without burrowing owl surveys because the species is not resident during the winter months and would not reestablish residence at former nest sites that have been removed or disturbed. The direct impact of the Proposed Action on burrowing owls would be the loss of 13 nest sites or an eventual 72 percent decline in existing nest sites on Buckley AFB.

Other construction impacts to black-tailed prairie dogs and other wildlife species would consist of excess noise from construction equipment, and movement and close proximity of humans and moving equipment. This activity would result in startle and alarm behaviors and other stressful behaviors such as escape movements, extra time spent in burrows and a loss of foraging time. A positive impact to black-tailed prairie dogs and other colony inhabitants would result from the demolitions of various buildings and facilities, including Buildings 1620, 1631, 1632 and the Marine Compound Concrete Foundation, if these acreages are reseeded with short



or mixed grass plant species and incorporated into existing black-tailed prairie dog wards. In addition, the presence of humans and construction activities would reduce predator attempts on nearby black-tailed prairie dogs.

Impacts to the Northern leopard frog could occur during construction activities at the Williams Lake ADP. A minor impact on wintering bald eagles and ferruginous hawks will occur due to contractions in black-tailed prairie dog colony acreage resulting from plague, construction, and safety control actions.

Two rare plant communities, the needle-and-thread mixed grass prairie community and the plains cottonwood/peachleaf (or coyote) willow community both occur at Buckley AFB. Approximately 71 acres of mixed grass prairie fall within the Proposed Action including the MFH (39 acres), Community Center (19 acres), Aspen Corridor (1.3 acres), and Williams Lake (12 acres) ADPs. Impacts to mixed grass prairie would be spread-out over the life of the CIP implementation, and timely reseedling of disturbed mixed prairie acreage would minimize short-term losses due to construction. The largest impact would occur in the Privatized Housing ADP where 39 acres of existing mixed grass prairie would be displaced by residential structures and landscaping.

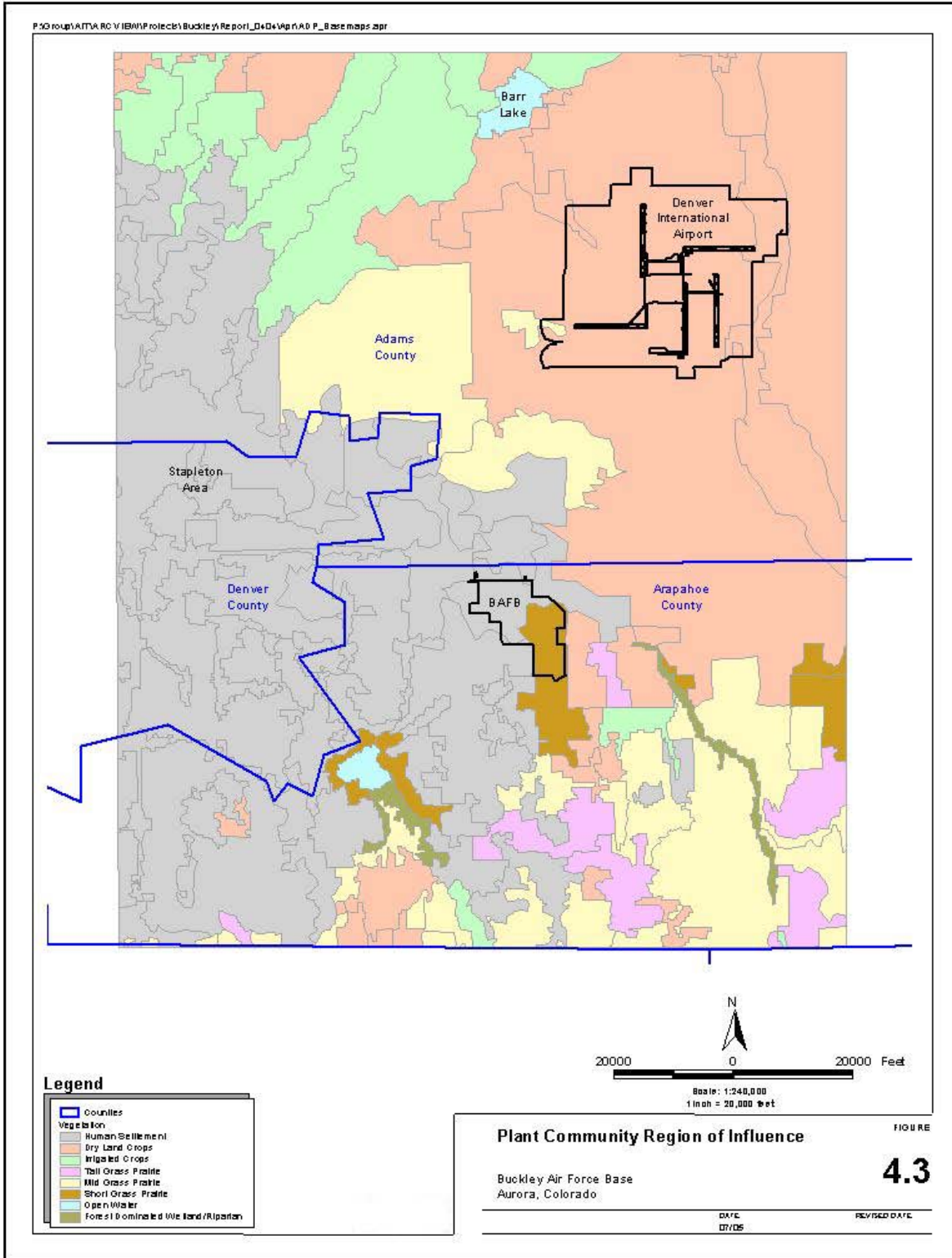
Approximately 2.96 acres of plains cottonwood/coyote willow community occurs on the Williams Lake (0.63 acres) and the Headquarters Area (2.33 acres) ADPs. A portion of the Williams Lake acreage may be lost during construction of new recreation facilities; however this impact can be minimized by replanting the two species. The acreage within the Headquarters Area ADP would not be disturbed because it is located within the floodplain of East Tollgate Creek.

#### **4.3.9.5 Cumulative Impact**

##### **Plant Communities**

The cumulative impact of the Proposed Action on plant communities on and surrounding Buckley AFB was determined by comparing the distribution of existing and recent past open space, agricultural and range acreages with projected land use changes in western Arapahoe and Adams counties. The ROI for this resource is western Adams County from Barr Lake State Park south to the Arapahoe/Douglas county line, and bounded by DIA on the east and the Stapleton

airport development area on the west, as shown in Figure 4.3. During the second half of the 20<sup>th</sup> century this area consisted of a mosaic of rural, suburban and urban acreages. However, the relative percentage and rate of change from natural and low intensity agricultural land uses to high-intensity and urbanizing land uses has accelerated over the past 50 years. Tables 4.20 and 4.21 show that in 1960, 94.8 and 91.12 percent of the developable (inhabitable) acres in Adams and Arapahoe counties, respectively, was rural. At that time 1.69 and 2.19 percent of developable land was urban and 3.5 and 6.69 percent was suburban (Ex-urban). By 2000 the percentage of rural land had declined to 89.8 and 84.4 percent, respectively, an average reduction of 5.86 percent. During the same period, urban land in Arapahoe County increased from 2.19 to 11.02 percent of developable land, an increase of 500 percent (Natural Diversity Information Source [NDIS], 2004). Similarly, urban acreage in Adams County has increased 280 percent from 1960 to 2000. A large proportion of this land use change occurred within and near the ROI.



<b>Table 4.20: Adams County Land Type Makeup</b>			
<b>Year</b>	<b>Land Type</b>		
	<b>Rural</b>	<b>Ex-urban</b>	<b>Urban</b>
	<b>Percent of Developable Land</b>	<b>Percent of Developable Land</b>	<b>Percent of Developable Land</b>
1960	94.80%	3.50%	1.69%
1970	93.89%	3.73%	2.38%
1980	91.48%	4.94%	3.59%
1990	90.89%	4.96%	4.15%
2000	89.80%	5.45%	4.75%

<b>Table 4.21: Arapahoe County Land Type Makeup*</b>			
<b>Year</b>	<b>Land Type</b>		
	<b>Rural</b>	<b>Ex-urban</b>	<b>Urban</b>
	<b>Percent of Developable Land</b>	<b>Percent of Developable Land</b>	<b>Percent of Developable Land</b>
1960	91.12%	6.69%	2.19%
1970	89.61%	6.58%	3.81%
1980	86.08%	5.75%	8.17%
1990	85.43%	4.59%	9.98%
2000	84.40%	4.58%	11.02%

\* Source: Colorado Natural Diversity Information Source, 2004.

The current distribution of land use and plant communities in the ROI is shown in Table 4.22. Table 4.22 indicates that of the 41,659 acres in the ROI, 42.68 percent are in dry land crops such as grains, grassland range and pastures; and greater than 18 percent is urban and mixed-grass prairie, respectively. In general terms one-fifth of the ROI exists as urban landscape and four-fifths is a mosaic of rangeland, short-grass and mixed-grass prairie, and dry land grain farming (NDIS 2004).

<b>Table 4.22: Existing Land Use and Plant Communities, Cumulative Impact ROI*</b>		
<b>Primary Plant Community</b>	<b>Acres</b>	<b>Percent of ROI</b>
Urban	7,763	18.63
Dry Land Crops	17,782	42.68
Irrigated Crops	3,830	9.20
Tallgrass Prairie	2,396	5.75
Mixed-grass Prairie	7,626	18.30
Short-grass Prairie	1,006	2.41
Foothill and Mountain Grasslands	221	0.53
Deciduous Oak Shrubland	289	0.69
Open Water	300	0.72
Forested Wetland/Riparian Zones	252	0.60
Barren Land	192	0.46
Total	41,659	100

\* Source: Arapahoe CO urban population Growth at: <http://ndis.nrel.colostate.edu/conservationcnty>.

The cumulative impact to the distribution of urban, agricultural, and natural plant communities (habitats) is the sum of land use changes at Buckley AFB in addition to all other projected increases in urban acreage in the ROI. Planned urban growth in western Adams and Arapahoe counties through 2009 was extrapolated from recent city and county zoning plans in the ROI, particularly the E-470 corridor and the Northeast Plains area located east and northeast of Buckley AFB. This trend analysis indicates a decrease in acreage of all prairie plant communities and agricultural plant communities, and a corresponding increase in urban acreage (NDIS, 2004). This change constitutes a minor adverse impact to the existing prairie and dryland crop plant communities of western Adams and Arapahoe counties.

### **Noxious Weeds**

The urbanizing Front Range and the I-25 and I-70 corridors are sources of invasive and noxious weed intrusions into the prairie grasslands of eastern Colorado. The continued growth of Denver into the ROI would create opportunities for noxious weeds to colonize disturbed ground. Compliance with state and county weed laws would limit increases in noxious weed acreages resulting from land clearing and crop growing. Construction activities, including the Proposed Action, would cause an adverse impact to existing plant communities due to increased

encroachment by invasive and noxious weeds. Impacts at Buckley AFB would be relatively small due to proactive noxious weed avoidance and remediation plans, however the cumulative impact would be large due to private and other governmental building activity within the ROI.

### **Wildlife**

Wildlife populations and diversity in the cumulative impact ROI mirror the diversity and abundance of native plant communities. As Tables 4.20 and 4.21 show, undeveloped habitats in the ROI, particularly mixed grass prairie, while relatively abundant, are declining in the face of urban growth. This is a phenomenon common to metropolitan areas. The cumulative impact of the Proposed Action would be an adverse effect on native vertebrate and invertebrate animal populations, while suburban adapted species such as the English sparrow, feral cat and dog, starling, Norway rat, and house finch would benefit. Species specifically associated with black-tailed prairie dog colonies, such as the burrowing owl, ferruginous hawk and mammalian predators such as the badger would be positively impacted within the ROI due to the management of the Rocky Mountain Arsenal (RMA) for black-tailed prairie dogs by the USFWS. Other grassland species which are not primarily associated with these squirrel colonies would likely sustain a long-term loss of habitat, however, this would not be considered significant.

### **Threatened/Endangered Species And Species Of Special Concern**

Within the ROI several species would be adversely impacted due to the cumulative effect of the Proposed Action. As a result of general grassland habitat loss in the ROI due to the build-out of undeveloped land for commercial and residential use, several rare raptors including wintering bald eagles and ferruginous hawks; the black-tailed prairie dog and the burrowing owl; the loggerhead shrike; Northern leopard frog; olive-backed pocket mouse; and the swift fox would be adversely effected.

One nesting pair of bald eagles is known to exist within the ROI and a number of other individual eagles winter at the RMA and surrounding landscape including Buckley AFB. A minor cumulative impact on this species would result from changes in the distribution of black-tailed prairie dog colonies within the ROI, as well as a decrease in black-tailed prairie dog acreage at Buckley AFB and along the E-470 corridor. Cumulative impact on the ferruginous hawk is similar to bald eagle. Long-term impact to water courses resulting from channeling and

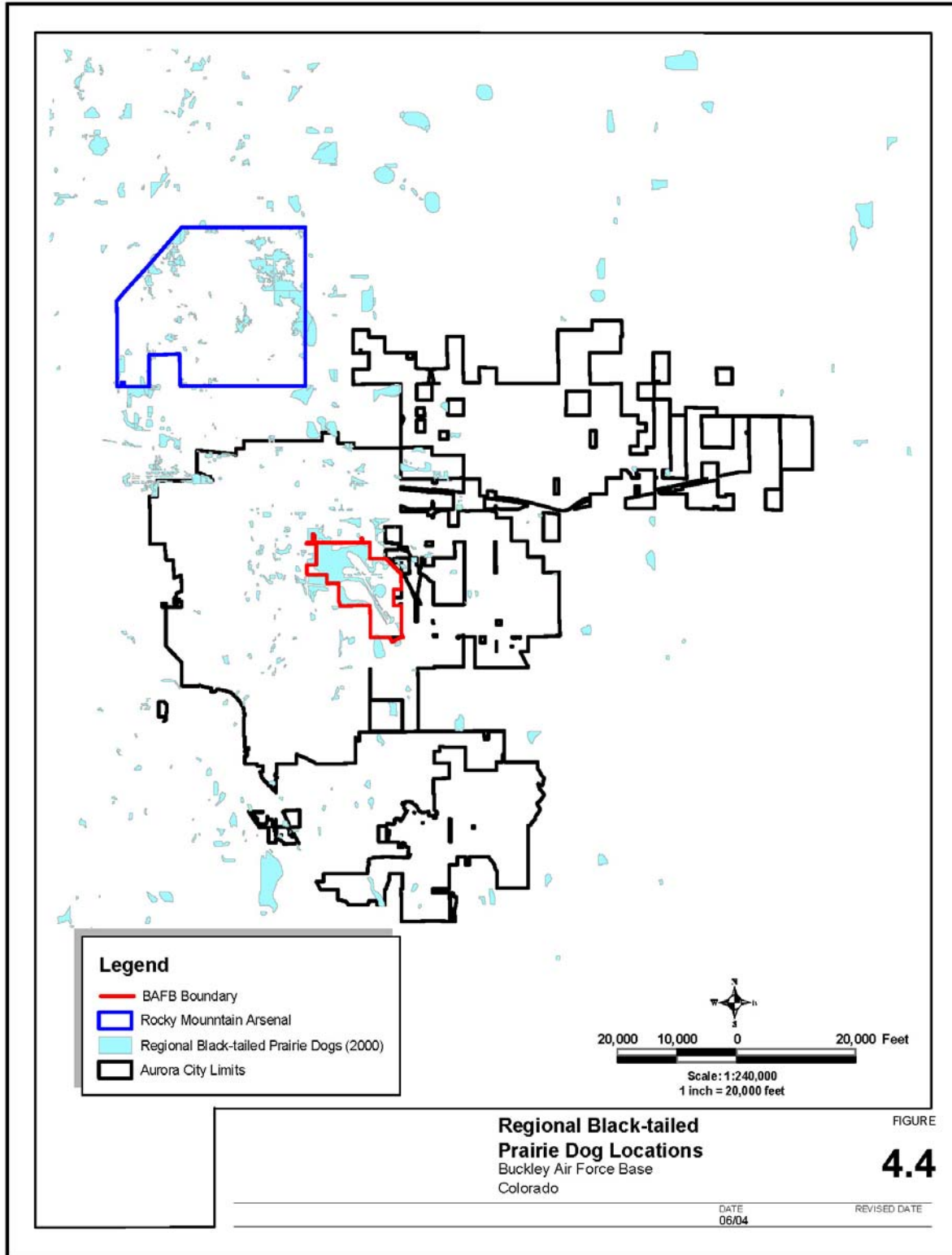
runoff severity changes due to urbanization would have a small adverse impact on the Northern leopard frog. The Preble's meadow jumping mouse is not known to inhabit the ROI (USFWS 2000). However, mixed grass prairie habitat used by the olive-backed pocket mouse occurs in the northern and southeastern portion of the ROI and would sustain some loss due to build-out of the E-470 corridor. Impacts to plains cottonwood riparian woodland would be minimal over the short-term due to regulatory constraints; and minor over the long-term, as a result of hydraulic changes due to regional increases in runoff peaks.

The black-tailed prairie dog (a state species of concern), burrowing owl, and associated grassland species would likewise be adversely affected within the ROI by conversion of rural property to urban uses. Currently, the ROI contains approximately 373 active black-tailed prairie dog colonies covering an area of 1,442.6 acres. This yields an average colony size of 3.86 acres. As shown in Figure 4.4 colonies are dispersed throughout the ROI, however two areas of concentration are also evident: Buckley AFB and the RMA. Both of these areas are managed by the federal government. RMA is a National Wildlife Refuge being managed for a variety of the grassland species including the black-tailed prairie dog. The current black-tailed prairie dog objective at RMA is to increase colony acreage from 660 acres in 2003 to approximately 2,000 acres in the near future (Stone, 2005). The 2,000 acre target would return colony acreage to the average high of 1,500 to 2,000 acres, which occurred in 1992, 1993, and 2000 (Stone, 2004). Cumulative impacts to black-tailed prairie dogs in the ROI include the build-out of Buckley AFB and the E-470 corridor, and infilling in currently developed portion of surrounding Aurora. Plague coupled with recent control measures used to insure that black-tailed prairie dogs do not interfere with mission objectives at Buckley AFB have reduced colony acreage to approximately 296 acres (ERO Resources, 2004). The build-out of Buckley AFB would result in the loss of approximately 184 acres of black-tailed prairie dog colony, and the development of the E-470 corridor is estimated to result in the loss of 77 acres for a total of approximately 261 acres of prairie dog colonies. This loss would be at least partially compensated by the continued management of RMA to raise the total acreage of black-tailed prairie dog colonies toward the historic average. Although the cumulative impact on the black-tailed prairie dog may be a positive increase of colony acres, the colony distribution would

change so that colonies are more clumped in the northern portion of the ROI, and more diffuse in the remainder of the ROI.

Recent research suggests that the frequency of bubonic plague return to colonies is related to colony proximity and size (larger, more aggregated colonies are infected more often). Thus the effect on plague may be positive for the non-RMA portion of the ROI. The increased size and density of black-tailed prairie dog colonies in the northwest portion of the ROI may have also have a positive impact on plague outbreaks because RMA is actively monitored and managed for plague to the extent that this growing, formerly susceptible colony location may be able to grow again without the threat of uncontrolled disease. As a result of management activities on both RMA and Buckley AFB, a small adverse cumulative impact would result from the Proposed Action.





#### **4.3.10 Traffic/Transportation**

This section documents transportation impacts for the Proposed Action. It addresses CIP generated impacts to the street system, traffic volumes, transit services and facilities, and alternative transportation. A transportation analysis was not conducted for the CIP projects in the GP (Buckley AFB 2002a). Therefore morning (am) and evening (pm) peak hour conditions consistent with the majority of the potential build-out year of the CIP in 2010 were estimated. The difference between estimated traffic conditions of existing land uses and the Proposed Action provided a comparison, by which transportation impacts can be measured.

The Proposed Action incorporates several transportation improvements that would promote a diverse transportation, walk-able, and compact mixed-use community. These aspects include:

- Consolidation of facilities and functions - Community service and administrative facilities would be located in close proximity to MFH.
- Non-motorized transit improvements - Basic goods and services would be available within walking distance. Sidewalks, street integration, and proximity of community service and residential areas would encourage walking and improve pedestrian connectivity.
- RTD would be within walking distance of the personnel and residential community.
- Access to Buckley AFB from I-225 and E-470 would improve as interchanges, road improvements, and base entrances are activated reducing travel time for base personnel, retirees, and other visitors.

When the housing area is developed along the western side of the installation, Telluride Street would be extended to provide access. A-Basin Avenue would be upgraded to support the planned community center and other community services such as the temporary lodging and visitors quarters. Steamboat Avenue would be realigned to remove portions of this roadway from within the Clear Zone and the Primary Surface.

For the Proposed Action, the mixed-uses, combined with the realigned streets and integrated pedestrian paths would result in less traffic congestion, increased transit use and improved pedestrian circulation.

Impacts on traffic at Buckley AFB resulting from the Proposed Action would be created from additional vehicles traveling to and within the base boundaries, and from construction and operation of the CIP projects. On-base and off-base traffic increases created by construction activities and operation of completed facilities would be considered direct effects. Potential impacts of on-base and off-base traffic details for the North and Telluride Gates, the Mississippi Gate and the proposed future Munitions and Hazardous Materials Gate are discussed below.

#### 4.3.10.1 Demolition and Construction

During construction, vehicle trips would be necessary to deliver construction materials and equipment, remove demolition debris and soils, and transport construction workers to and from work sites. Demolition of existing and construction of new facilities would result in some short-term traffic impacts to the surrounding community. Building demolitions are expected to last approximately 2-3 months. The most noticeable impacts related to the anticipated demolition/construction effort would be in the form of truck hauling trips, and heavy equipment traffic. The majority of truck trips would occur in the first quarter of each construction project. Trucks would be directed towards and travel on the primary roads.

Table 4.23 shows the estimated weight and volume of debris used to calculate the number of truck trips required for debris removal from construction and demolition activities. The values on Table 4.23 assume that a typical truck with trailer can carry 22 cubic yards (yd<sup>3</sup>) of debris.

<b>Table 4.23: Construction/Demolition Debris Handling Traffic - Proposed Action</b>			
<b>Year</b>	<b>Weight of Debris Generated (tons)</b>	<b>Volume of Debris Generated (yd<sup>3</sup>)</b>	<b>Number of Truck Trips Required</b>
2002	143	80	4
2003	20,065	11,093	504
2004	44,575	23,471	1,067
2005	47,839	26,483	1,204
2006	123,016	65,414	2,973
2007	266	149	7
2008	33,569	18,556	843
2009	126,809	61,081	2,776

<b>Table 4.23: Construction/Demolition Debris Handling Traffic - Proposed Action</b>			
<b>Year</b>	<b>Weight of Debris Generated (tons)</b>	<b>Volume of Debris Generated (yd<sup>3</sup>)</b>	<b>Number of Truck Trips Required</b>
2010	174,159	89,673	4,076
TBD*	70,618	39,056	1,775
Totals	<b>641,058</b>	<b>335,056</b>	<b>15,230</b>

\* TBD = To Be Determined for projects scheduled beyond 2011 (year of completion currently unknown/unspecified).

Debris hauling would be limited to weekdays and typical work hours to avoid peak pm commuter hours. Most of the hauling activity would occur outside of the peak commute hours, but am inbound trips may coincide with the am peak commuter traffic hours. Hauling of construction and demolition debris would occur approximately 6.5 hours per day, five days per week. During construction the portions of Aspen Street that bisect the installation may be closed temporarily. Limited modifications to other streets adjacent to the project could result in short-term impacts to these streets. The temporary closure of portions of Aspen Street would result in a slight increase to traffic on alternative routes, such as Breckenridge and Telluride Avenues. This would be expected to add less than 10 percent additional traffic to the daily volumes already traveling on the alternative routes during primary road closures.

#### **4.3.10.2 ADP Trip Generation**

Trip generation resulting from the Proposed Action was estimated based on the net increase in housing units and redevelopment or expansion of Buckley AFB facilities. The trips generated by these new and expanded facilities were added to the existing conditions to forecast future traffic volumes resulting from the development of the CIP. The traffic-generating characteristics of most of the components of the ADPs are identified in the Institute of Transportation Engineers (ITEs) Trip Generation, 6th Edition published in 1997 (ITEs, 1997). The Trip Generation manual provides information on the trip-making profiles for many land uses. This manual is recognized as the industry standard for trip generation documentation.

The ITE's trip generation rate for Apartments (ITE land use [LU] 220) was used to estimate the non-adjusted traffic generation for the multi-family housing and dorms including townhomes/duplexes and apartments. This land use was selected instead of the Residential

Condo/Townhome (ITE LU 230), because it is limited to units owned by the resident. Rental residences typically generate more traffic than non-rental residences and represent a more conservative trip value. Fewer trip rates were used for the dormitory units to reflect lower per unit car ownership of single personnel. Trip rates for dormitories were reduced by 19 percent to reflect lower car ownership. For the single-family units, ITE Land Use Single Family Housing (ITE LU 210) was used.

ITE Trip Generation rates were also used as a basis for estimating trip generation for redeveloped and expanded Buckley AFB facilities. Most of the proposed community service facilities would provide recreational and social opportunities to military personnel and their families. For purposes of this analysis, it was assumed that up to 90 percent of the vehicle trips generated by these facilities would be generated by off-base civilian personnel. The remaining 10 percent were assumed to be related to Buckley AFB personnel and their resident families. Of those, residents living within approximately 800 feet of the community facilities were assumed to walk to and from these facilities.

The ADPs were reviewed to determine the percent of residences within this 800-foot radius. Completion of the CIP would result in approximately 26 percent of housing being located within walking distance of the community support facilities. The result of deducting 26 percent of the trips from the 10 percent internally generated trips results in an overall deduction of approximately 23 percent of the non-housing generated trips (Appendix G).

<b>Table 4.24: Traffic Volume Impact - Proposed Action</b>			
<b>Category <sup>(1, 2)</sup></b>	<b>Daily Trips<sup>(3)</sup></b>	<b>AM peak Hour Trips</b>	<b>PM peak Hour Trips</b>
<b>Existing Land Use (ELU) Baseline <sup>(4)</sup></b>	<b>65,493</b>	<b>6,244</b>	<b>7,401</b>
ADP-1 (Privatized Housing)	3,451	275	371
ADP-2 (Entry Gates)	1,564	131	163
ADP-3 (Dormitory)	4,290	321	441
ADP-4 (Aspen Corridor)	786	104	123
ADP-5 (Community Center)	3,336	269	398
ADP-6 (Industrial Support)	1,217	161	181
ADP-7 (460th SW Headquarters)	3,967	121	105

<b>Table 4.24: Traffic Volume Impact - Proposed Action</b>			
<b>Category</b> <sup>(1, 2)</sup>	<b>Daily Trips</b> <sup>(3)</sup>	<b>AM peak Hour Trips</b>	<b>PM peak Hour Trips</b>
ADP-8 (Williams Lake)	1,347	178	236
All ELUAs	4,521	316	362
<b>Proposed Action Trips</b>	<b>24,479</b>	<b>1,875</b>	<b>2,379</b>
<b>Total 2010 Trips</b>	<b>89,972</b>	<b>8,119</b>	<b>9,780</b>
<b>Percent Impact</b>	<b>37.38%</b>	<b>30.03%</b>	<b>32.15%</b>

- (1) Calculation spreadsheet provided in Appendix G.
- (2) Based on total market rate multi-family housing (ITE LU 230) and single family housing (ITE LU 210); community commercial (ITE LU 814); community service (ITE LU 495); Research and Development (Buckley AFB administrative) (ITE LU 760); and light industrial (ITE LU 110).
- (3) Trip generation rates given per 1,000 square foot of Gross Floor Area, unless otherwise noted (See Appendix G).
- (4) Based on existing land use acreage and 1 percent growth rate per year to 2010.

Proposed Action generated am and pm peak hour traffic volumes were added to the existing traffic volumes to estimate peak hour volumes for the Proposed Action. For purposes of developing a worst-case scenario, traffic volumes for the existing conditions were estimated based on the distribution of ELUs. A 1 percent per year growth rate in traffic volume was added to the estimated ELU traffic volumes. This projected growth in vehicle trips to 2010 represents a conservative, or “worse case” estimate. By comparing total traffic volumes for the 2010 ELU baseline volumes and Proposed Action, the percent impact of traffic can be identified as illustrated in Table 4.24.

Proposed Action traffic volumes would increase am and pm peak hour traffic levels by between approximately 30 and 32 percent. Some entry gate and intersection level of services would degrade during the am peak hour in 2010. An increase in delay is expected at most on-base intersections.

#### 4.3.10.3 Alternative Transportation

Existing and future transit service would continue to be used as a means to access the installation. Transit stops are incorporated into the future transit plan for the City of Aurora. Overall the improved services planned by RTD are expected to accommodate any increase in ridership that would result from the Proposed Action. Therefore these additional trips would not create a significant adverse impact to transit operations in the area.

The Proposed Action would provide pedestrian connections throughout the base which would encourage pedestrian travel. The revised roadway configuration would provide more direct routing and sidewalk connections and shorter walking distances across the installation. Improved intersection alignments would provide more identifiable roadway intersections and crosswalks, allowing safer crossing for pedestrians at more regular intervals. Proposed roundabouts would contribute to slowing vehicular traffic, which would help accommodate non-motorized (pedestrian and bicycle) trips. Beneficial effects are expected, but no adverse impacts to non-motorized facilities or operations would occur.

#### **4.3.10.4 Installation Traffic**

Vehicular traffic would continue to access the installation through the Main Gate and Telluride Street Gates. Telluride Street would be extended to provide access to the Privatized Housing ADP.

#### **4.3.10.5 Main and Telluride Gates**

##### **Off-Base Traffic**

The gate selected by individuals commuting to Buckley AFB would depend primarily on their residential location in respect to the base and preferred travel routes. It was assumed that 90 percent of the additional traffic created by the Proposed Action would be off-base personnel that enter the base through the Main and Mississippi Gates. The remaining 10 percent of vehicle trips would be on-base personnel.

For this EA it will be assumed that one-half of all new traffic would access and exit the base through (1) the existing Main Gates, and (2) the existing Mississippi Gate. Under this assumption, approximately 12,240 new vehicle trips would enter through the Main Gate per day. The Main Gate would see approximately 938 additional peak morning hour inbound vehicles in 2010, increasing total traffic by 30 percent. The number of vehicles traveling during the peak evening traffic hour west of the Main and Telluride Gates, on 6<sup>th</sup> Avenue, is projected to be approximately 3,884 vehicles per hour. Assuming that three-quarters of the total 1,190 additional vehicles exiting the base from the Main Gate during the peak evening traffic hour travel west, this number would increase to approximately 4,777 vehicles per hour. Assuming that one-quarter of the total 1,190 remaining additional vehicles, or 298 vehicles, exiting the base during the peak evening traffic hour travel east of the gates at the intersection of 6<sup>th</sup> Avenue and

state Highway 30, this number would increase to approximately 1,223 vehicles per hour, a 32 percent increase. Off-base traffic at the new Telluride Gate would not be expected to be impacted significantly by the Proposed Action, as this gate is primarily used to access the BX and Commissary.

Traffic proceeding to the base from E-470 exit 19 would turn east or west off the exit ramp on 6<sup>th</sup> Avenue Parkway, and travel south on Gun Club Road or Picadilly Road. From Gun Club Road, traffic would travel east on Bayaud Avenue, turning left onto Picadilly Road (south). Southbound traffic on Picadilly Road would turn right (northeast) on state Highway 30 (which turns into 6<sup>th</sup> Avenue) and access the Main Gate. Assuming that one-quarter of all new traffic using the Main Gate daily would exit and enter the base to and from the east, and all of this traffic would be assumed to travel on E-470, traffic flow at exit number 19 would increase by 3,060 vehicles per day. The 2010 predicted traffic entrance exit flow at exit number 19 is 5,965 vehicles per day (PBFH&U, 2002). The Buckley AFB contribution would comprise 51.3 percent of this flow.

With an approximately 32 percent increase in off-base traffic on 6<sup>th</sup> Avenue in both the east and westbound directions during the peak morning and evening travel hours the Proposed Action would create a minor increase in off-base traffic at the Main Gate.

### **On-Base Traffic**

Due to proposed ADP development, it would be likely that the majority of resident personnel would proceed east on Breckenridge Avenue and south on Aspen Street until reaching the Headquarters Area or Industrial Support areas. Employees would access parking lots directly from Aspen Street. Parents delivering children to the new CDC would proceed east on Breckenridge Avenue, turning right to reach the parking lot for the Center. Alternatively, parents dropping children off at the existing CDC would travel east on Breckenridge Avenue to Aspen Street; proceed north (turning left) on Aspen Street to Crested Butte Avenue; turn right (east) on Crested Butte; and turn left into the parking lot. In both cases parents would then proceed to the area on the base at which they work.

Traffic volumes at the Main Gate may have decreased in the recent past, due to the opening of the Telluride Gate. The increase in vehicle trips entering the Main Gate is estimated to be



12,240 trips per day. Assuming an even distribution of these vehicle trips during the peak morning hour, the increase in traffic entering the Main Gate would increase from 3,122 to 4,060 (a 30 percent increase). The proposed inbound and outbound processing lanes for the Entry Gates ADP are designed to handle the increased traffic. On-base road traffic in the vicinity of the Main Gate would increase traffic volume on Aspen Street. The proposed roadway improvements at 6<sup>th</sup> Avenue and Aspen Street would provide the capacity to handle this additional traffic flow.

#### 4.3.10.6 Mississippi Gate

##### Off-Base Traffic

The proposed CIP EA construction projects would affect off-base traffic at the Mississippi Gate, as there would be an increase in construction and delivery vehicles coming onto the base. Operation of the proposed CIP project buildings and facilities may or may not have affects on traffic at the Mississippi Gate, depending on where personnel live.

Since all construction and demolition vehicles required to complete the CIP projects would access Buckley AFB through the Mississippi Gate, off-base traffic on Mississippi Avenue would increase throughout the phases of construction and demolition activities of the Proposed Action. The impacts would vary depending on the starting and ending dates of each project. Using the number of construction and demolition vehicles, as well as contractor employee personnel vehicles used to make air emission calculations (Section 4.3.1.2) and considering one-half of the projects to be occurring simultaneously in a given year (a reasonable worst-case condition), the number of construction and demolition vehicles and personnel contractor employee vehicles that would be entering the Mississippi Gate off of Mississippi Avenue daily are shown on Table 4.25, below.

<b>Table 4.25: Construction and Demolition Vehicles Entering the Mississippi Gate – Proposed Action</b>			
<b>Year</b>	<b>Construction and Demolition Contractor Employee Traffic (Vehicles/Day)</b>	<b>Construction and Demolition Delivery Traffic (Vehicles/Day)</b>	<b>Total (Vehicles/Day)</b>
2002	8	32	40
2003	18	72	90

**Table 4.25: Construction and Demolition Vehicles Entering the Mississippi Gate – Proposed Action**

Year	Construction and Demolition Contractor Employee Traffic (Vehicles/Day)	Construction and Demolition Delivery Traffic (Vehicles/Day)	Total (Vehicles/Day)
2004	32	128	160
2005	34	136	170
2006	50	200	250
2007	8	32	40
2008	10	40	50
2009	38	152	190
2010	8	32	40
TBD*	36	144	180
Totals	<b>206</b>	<b>824</b>	<b>1,030</b>

\* TBD = To Be Determined for projects scheduled beyond 2011 (year of completion currently unknown/unspecified).

Currently approximately 780 peak morning hour inbound vehicles pass through the Mississippi Gate. Using 2006 as a worst-case year and assuming that half the additional construction-related vehicles arrive during peak morning hours (as construction equipment and materials deliveries are likely to take place throughout the day), this number would increase to 905 vehicles, a 16 percent increase. West of the Mississippi Gate, Mississippi Avenue is a four-lane divided boulevard currently carrying 700 vehicles per hour on the road during peak traffic hours. Assuming that three-quarters of the total 125 additional construction-related vehicles exiting the base during the peak evening traffic hour travel west, this number would increase to approximately 794 vehicles per hour, an 13 percent increase.

After the proposed ADP projects are complete 12,240 new vehicle trips would enter the base through the Mississippi Gate daily, with approximately 4,060 total vehicle trips arriving during the morning peak traffic hour. The number of inbound vehicles passing through the Mississippi Gate during the peak morning hour would increase by 938 vehicles, a 30 percent increase. Assuming that three-quarters of the total 1,190 additional vehicle trips exiting the base during the

peak evening traffic hour travel west, the number of vehicles traveling west on Mississippi Avenue would increase by approximately 893 vehicles per hour, to total 4,777 vehicles per hour.

Traffic proceeding to the Mississippi Gate from E-470 exit 16 would turn west on Jewell Avenue, then turn right (north) on Dunkirk Street or Tower Road. Dunkirk Street veers from north to east and becomes Mississippi Avenue, providing access to the Mississippi Gate. Traffic traveling north on Tower Road would turn right (east) onto Mississippi Avenue and access the Mississippi Gate. Assuming that one-quarter of all construction traffic would exit and enter the base to and from the east, and all of this traffic would travel on E-470, traffic at exit number 16 would increase to 2,963 vehicles per day (a 2.1 percent increase).

Assuming that one-quarter of all commuter traffic using the Mississippi Gate daily would exit and enter the base to and from the east, and all of this traffic would travel on E-470, traffic flow at exit number 16 would increase by 3,060 vehicles per day. The 2010 predicted traffic entrance exit flow at exit number 16 is 10,434 vehicles per day (PBFH&U, 2002). The predicted Buckley AFB traffic would comprise 29.3 percent of this flow.

With a short-term construction/demolition increase of 8 to 9 percent and a long-term 30 percent operational increase in off-base traffic on Mississippi Avenue in the westbound direction, and a 1.2 percent short-term construction/demolition increase in off-base traffic at E470 exit 16, the Proposed Action would create a minor off-base traffic impact at the Mississippi Gate.

### **On-Base Traffic**

The proposed CIP construction and demolition projects and operation of completed buildings and facilities would affect on-base traffic at the Mississippi Gate, as the increase in construction and delivery vehicles and personal vehicles (dependant on residence location) would increase traffic on on-base arteries from this access point. Since all construction and demolition employee vehicles required to complete the proposed ADP projects would access Buckley AFB through the Mississippi Gate, on-base traffic traveling north on Aspen Street would increase temporarily. From Aspen Street, the majority of the construction and demolition traffic would travel west to project sites, turning left and using A-Basin Avenue (for the Community Center ADP) or turning left on Winter Park Avenue (for the Main Gate and North Section of the Dormitory ADP).

Portions of the Entry Gates ADP are located directly west of Aspen Street and would be accessed directly from that artery. Construction traffic for the north section of the Aspen Corridor would be accessed by traveling east (turning right) on Devils Thumb and Crested Butte Avenues. Williams Lake ADP would be accessed by turning right off of Aspen Street, and traveling east on Steamboat Avenue.

The increase in construction and demolition vehicles entering the Mississippi Gate under the worst-case circumstances in 2005 and 2006 is estimated to be 140 vehicles per day (Table 4.25). Assuming an even distribution of half of these vehicles arriving during the peak morning hour, the existing capability to open and operate two inbound processing lanes would be adequate. On-base road traffic in the vicinity of the Mississippi Gate would be increased by the 140 additional vehicles entering the facility. The existing on-base roadways would be upgraded to have sufficient capacity to handle this additional traffic flow.

It would be likely that the personnel entering Buckley AFB through the Mississippi Gate would proceed north on Aspen Street until reaching their destination at the 460th SW Headquarters, Industrial Support, or Aspen Corridor ADPs. Employees would access the parking lot directly from Aspen Street

The worst-case short-term increase in construction/demolition vehicles entering the Mississippi Gate is estimated to be 140 vehicles per day, while the long-term vehicle increase would be 12,240. Assuming an even distribution of half of the construction and all of the commuter vehicles during the peak morning hour the existing capability to open and operate two inbound processing lanes would be adequate. On-base traffic during construction and demolition projects in the vicinity of the Mississippi Gate would increased by 140 additional vehicles entering the facility and accessing project sites directly off of Aspen Street, traveling west on A-Basin or Winter Park Avenues, or traveling east on Steamboat or Breckenridge Avenues. On-base road traffic in the vicinity of the Mississippi Gate would be increased by the 12,240 additional vehicles entering the facility primarily traveling on Aspen and A-Basin Avenues. The proposed upgrades to Aspen Street would provide adequate capacity to handle this additional traffic.

#### **4.3.10.7 Munitions and Hazardous Materials Gate**

A new Munitions and Hazardous Materials Gate is proposed as part of this EA. The new Munitions and Hazardous Materials Gate would be located to the southwest of 6th Avenue, east and south of the old Navy Gate (an inactive/closed gate), and would provide access to Steamboat Avenue. The Proposed Action for the new Munitions and Hazardous Materials Gate includes installation of vehicle inspection area that would be used to inspect in- and outbound hazardous cargo vehicles. The gate would be constructed with deceleration and turning lanes parallel to 6<sup>th</sup> Avenue, allowing large vehicles entering the base to safely merge out of the general traffic flow prior to turning. The new gate would be primarily used to permit delivery of munitions and other hazardous cargo delivery vehicles onto the base, and as such, would receive infrequent and intermittent traffic. Buckley AFB has a Draft Integrated Environmental Response Plan (IERP), which includes a Spill Prevention Control and Countermeasure SPCC Plan, and a Hazardous Waste Management Plan (HWMP) that are in the final stages of review and publication. The procedures set forth in these plans would be implemented if an accidental spill from vehicles delivering or exporting materials through this gate were to occur. Estimated delivery frequencies are less than ten deliveries per month, with an average of four to five deliveries per month. The gate would not be continually manned, and entities delivering cargo through the new gate would be required to provide advance notice to the installation to prepare for acceptance. Munitions are currently transported onto the base using a gate located on the east side of the base. HAZMATs are currently transported on to the base using the Mississippi Gate, which is near a residential area. The proposed Munitions and Hazardous Materials Gate would be located along State Highway 30, which is a designated hazardous cargo route. Therefore, it was considered the best overall route even though the on-base transportation routes have increased. Therefore, the new gate would provide safer access for HAZMATs.

#### **Off-Base Traffic**

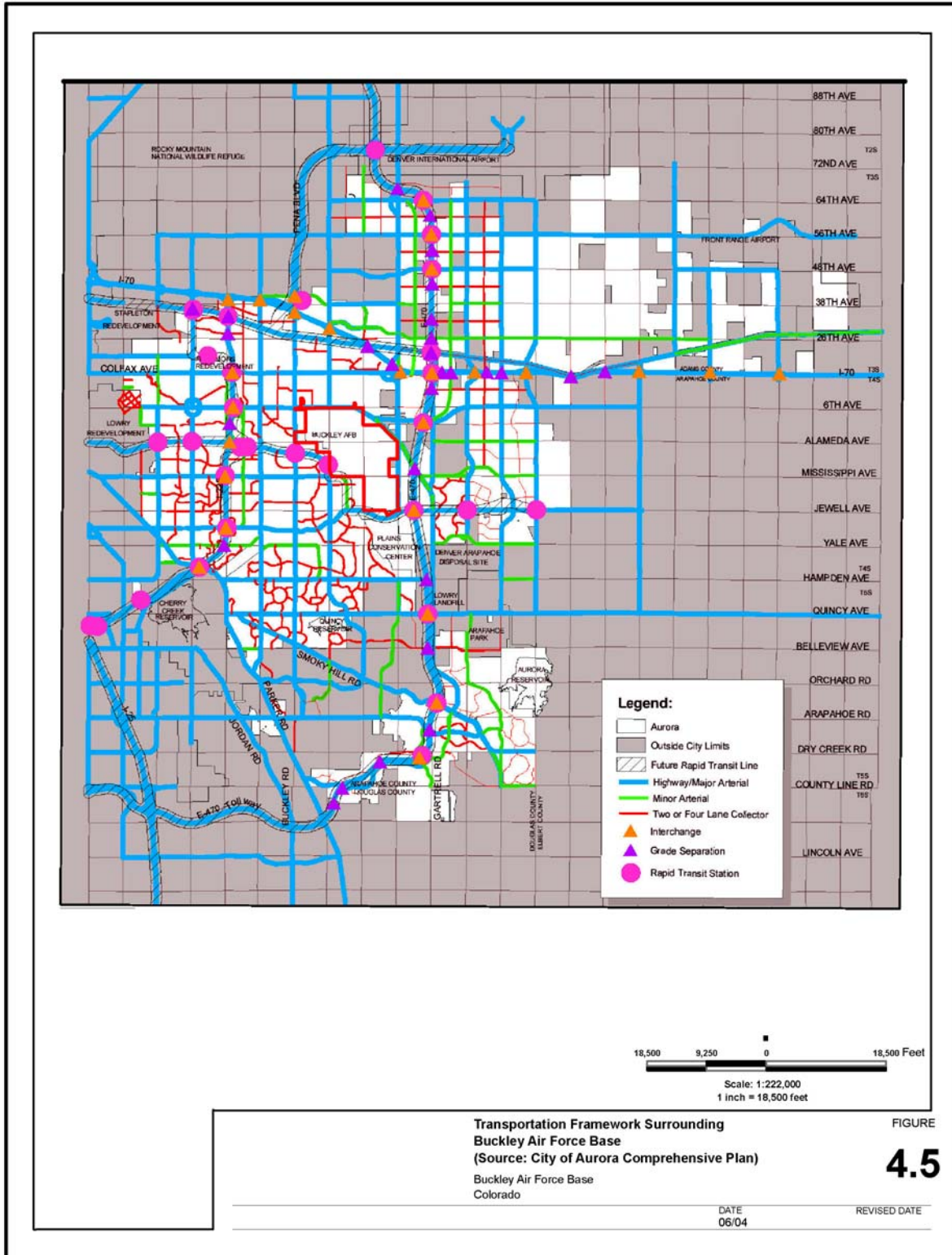
Since entrance through the proposed Munitions and Hazardous Materials Gate would be restricted to infrequent and intermittent delivery vehicles, the potential off-site traffic impacts would not be significant.

### **On-Base Traffic**

Due to the proposed location of the new Munitions and Hazardous Materials Gate, most delivery vehicles entering at this location would travel northwest on Steamboat Avenue to access drop-off destinations located throughout the base. The point at which the new gate would tie into Steamboat Avenue is relatively remote and would not create significant impacts on traffic. Since the delivery vehicles are primarily entering the base through the Mississippi Gates, on-base traffic would not change from existing conditions. Therefore, delivery vehicle traffic on on-base roadways would not change and no resulting significant on-base traffic impacts would occur.

#### **4.3.10.8 Cumulative Impacts**

The area evaluated for cumulative impacts includes highways, major and minor arterials and proposed Rapid Transit Lines (RTLs) within the City of Aurora transportation framework surrounding Buckley AFB (Figure 4.5).



Portions of the DMA's roads would begin to deteriorate at an accelerated rate in the next several years and the current percentage of roads listed in "Good or Fair" condition would dwindle from the present 55 percent to below 30 percent in the next five to ten years (MDEDC, 2004). Due to these circumstances, the number of road upgrades and maintenance projects in the DMA would increase. In addition, the traffic volumes on Aurora's east-west streets immediately east of I-225 have increased causing congestion.

If the City of Aurora is developed according to its projected future growth rate, approximately 452,783 new vehicle trips per day could occur (Appendix H). With the projected 89,972 additional Buckley AFB-generated trips per day by the year 2010 Buckley would account for 19.9 percent in of the increase, and would represent only 16.6 of the total traffic volume (Table 4.26). There would be moderate increases in traffic congestion in the surrounding transportation network as a result of this urban development.

<b>Table 4.26: Cumulative Traffic Volume - Proposed Action</b>			
<b>Category</b>	<b>Daily Trips*</b>	<b>am peak Hour Trips</b>	<b>pm peak Hour Trips</b>
Buckley AFB 2010 Total	89,972	8,119	9,780
Aurora 2010 Total	452,783	22,956	26,058
2010 Total	542,755	31,075	35,838
Percent Change	16.58%	26.13%	27.29%

\* Trip generation rates given per 1,000 square foot of Gross Floor Area, unless otherwise noted (See Appendix H).

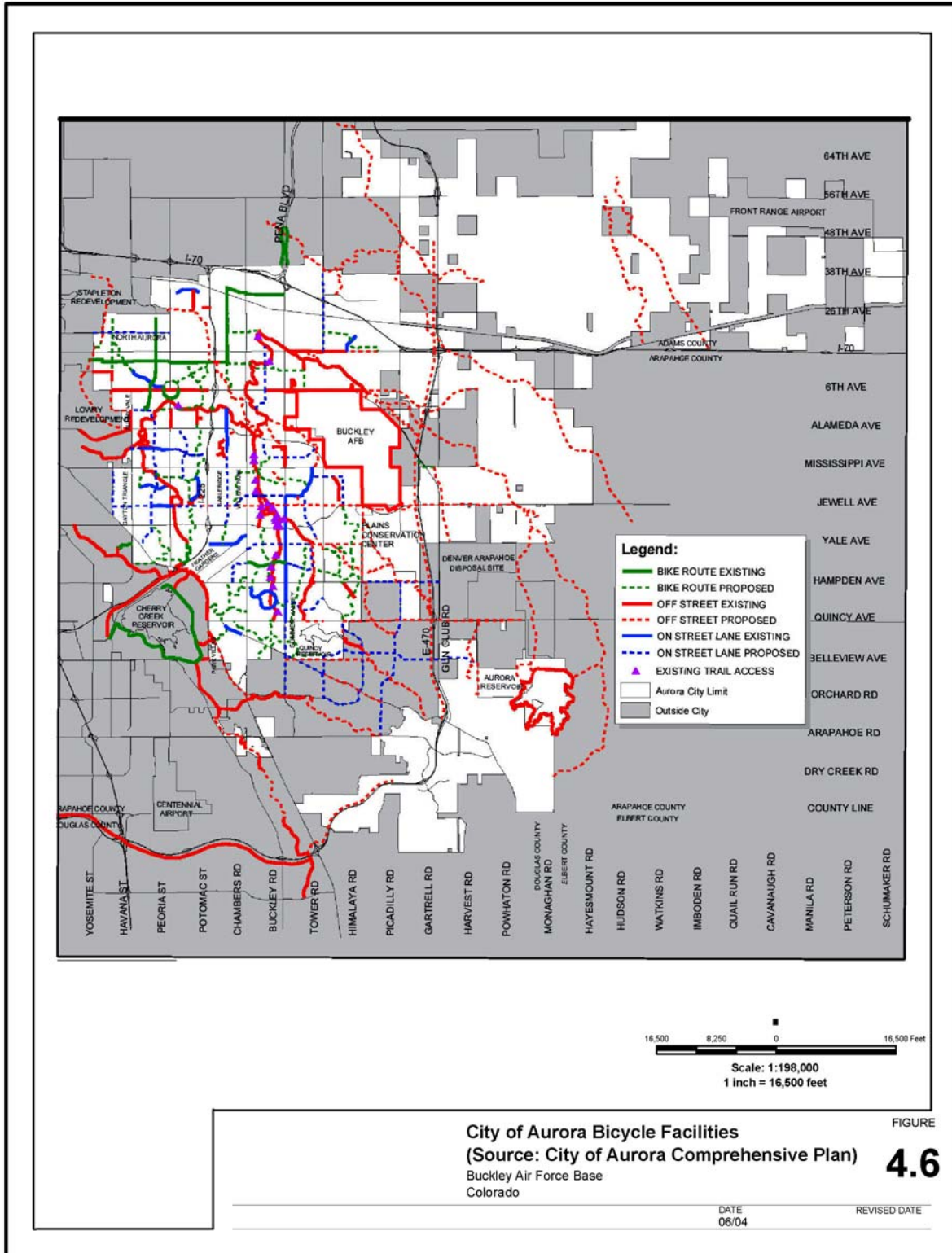
Traffic congestion would be reduced by regional transportation projects along corridors critical to the City of Aurora and by 41 City of Aurora CIP roadway and other planned Transportation Improvement Program projects planned for 2003-2008.

The forecasted traffic is the total number of trips that could be added in the transportation network surrounding Buckley AFB over and above the projected growth of traffic levels through 2010. Although these numbers seem high, it should be noted that they represent the worst case scenario of developing all currently developable land to the highest degree possible according to the current land use regulations.



Developable land within the surrounding community may be built at lower densities than the maximum allowable by the current zoning regulations. Alternative modes of travel would be increased by the additional bus services and light rail, bike and pedestrian trails planned for the area (see Figure 4.6).

The increase in mixed use development on-base and within concentrated areas such as the Fitzsimons Redevelopment Authority heighten the potential for alternate transport usage. The projected increase in the employment base linked with development of appropriate housing types would reduce the amount and length of work trips by increasing the number of people who both live and work in these new development centers. Therefore there would be a moderately adverse traffic impact.



The combination of increased multi-modal transit opportunities, increased use of alternate transportation, and decreased travel time between residences and places of employment would generate fewer impacts. Accessibility and mobility would improve through a more balanced transportation system.

#### **4.3.10.9 BMPs**

A construction transportation plan may be needed to minimize potential temporary impacts of construction on the local transportation system. The plan could include hours of construction, hours for hauling of materials, strategies for providing temporary parking for construction workers, detour routes and location of signs and other safety measures as needed. A temporary detour plan outlining planned detour routing would be developed in conjunction with specific project construction schedules to ensure adequate accessibility to occupied facilities.

#### **4.3.11 Water Resources**

Impacts on water resources at Buckley AFB could potentially result from construction, demolition and operation of the structures and facilities included in the Proposed Action. The ground disturbance phase of construction and demolition activities would require ground disturbance which can create erosion and cause runoff to become contaminated with particulate matter (silt, soils, sand, etc.). The storage of fuels, oils and other hazardous fluid materials can result in releases of these materials. In addition, fueling and operation of construction vehicles and equipment using these materials could create spills and leaks. The construction of buildings and installation of parking lots associated with the Proposed Action would result in an increase in impervious surfaces at the base. Increased impervious surfaces would cause additional volumes of runoff when precipitation events occur, increasing the volume of stormwater discharge. The potential water resource impacts on watershed and aquifers are further discussed below.

##### **4.3.11.1 Surface Water**

The ground disturbance phase of construction and demolition activities would require land disturbance that can result in surface water contamination due to erosion, increased particulates, turbidity, and transport of particulate matter via stormwater runoff. These effects would be considered to be direct and indirect, as erosion and transport of particulates could have both immediate local impacts, within Buckley AFB boundaries, and downstream impacts on receiving

streams off-base. Common BMPs for construction and demolition activities would be followed to minimize erosion. Preventive BMPs may include the following:

- Limit stockpiling of materials onsite
- Manage stockpiled materials to minimize the time between delivery and use
- Cover stockpiled materials with tarps
- Install snow or silt fences around material stockpiles, stormwater drainage routes, culverts, and drains.
- Install hay or fabric filters, netting, and mulching around material stockpiles, stormwater drainage routes, culverts, and drains.

BMPs for storage, transfer and use of fuels, oils and other hazardous liquid materials should be practiced to prevent impacts on surface waters. The measures can include the use of double-walled tanks or secondary containment for liquid storage areas and tanks; using care when transferring liquid materials to vehicles equipment and other containers; having spill cleanup materials available on hand at storage and transfer locations; expeditiously cleaning up spills and leaks; and inspecting and maintaining construction vehicles and equipment to detect and correct leaks.

Operation of the completed structures and facilities would increase the impervious surfaces at the base. Roofs, parking lots, sidewalks and walking paths would all reduce the areas in which precipitation can infiltrate the earth surface. Demolition of existing structures and associated features (parking lots, walkways, and sidewalks) would create some new areas where precipitation can infiltrate. Table 4.27 shows estimated increases (from construction), decreases (from demolition) and net increases in impervious areas anticipated from implementing the Proposed Action.

<b>Table 4.27: Increased Impervious Surface Calculations</b>			
<b>Year</b>	<b>Increased Impervious Surfaces Due to Construction (Acres)</b>	<b>Decreased Impervious Surfaces Due to Demolition (Acres)</b>	<b>Net Increased Impervious Surfaces (Acres)</b>
2002	15.06	0.00	15.06
2003	38.29	0.28	38.02
2004	55.87	2.03	53.84
2005	46.20	1.61	44.59
2006	14.56	3.83	10.73
2007	4.81	0.00	4.81
2008	7.82	0.47	7.36
2009	48.79	0.55	48.24
2010	0.99	4.30	(3.32)
TBD	21.93	0.99	20.94
<b>Totals</b>	<b>254.32</b>	<b>14.05</b>	<b>240.27</b>

\* TBD = To Be Determined for projects scheduled beyond 2011 (year of completion currently unknown/unspecified).

As shown on Table 4.27, the Proposed Action would increase the impervious surfaces at Buckley AFB by approximately 240 acres. This would increase the total impervious surface at the base to a total of 648 acres, an increase of 57 percent. The Proposed Action would result in 20 percent of the total 3,272 acre drainage area at Buckley AFB being impervious surface. The increases in impervious surfaces would result in increased stormwater runoff volumes and velocities. Increased stormwater runoff volume and velocities could create erosion issues that would impact surface waters. The base has extensive natural and man-made surface drainage as well as underground storm drainage lines that would convey increased stormwater volumes created from increased impervious surfaces. If existing stormwater infrastructure components are overloaded by increased stormwater loading impacts to surface waters could result. Stormwater loading and the potential need to improve and/or upgrade stormwater infrastructure components are discussed in Section 4.3.11.2.

#### **4.3.11.2 Stormwater**

Since proposed CIP construction and demolition sites are distributed throughout the facility (on the east and west sides of the base) potential impacts to all three of the streams that receive stormwater runoff from Buckley AFB could result from the Proposed Action. Operation of the completed buildings, parking lots, sidewalks and walking paths would create the additional runoff volume. Once construction projects are completed an increase of approximately 240 acres of impervious surfaces is expected. Assuming an annual precipitation rate of 15.24 inches per year and no losses due to evaporation, the anticipated increase in stormwater due to the Proposed Action would be approximately 99.42 mgd. The exact direction of increased runoff is not currently known, since studies have not been performed, and would need to be assessed in further detail through site-specific drainage engineering plans that would be developed for construction projects. Site-specific engineering plans may include comprehensive topographic map and contour reviews to determine directions of flow and which streams would receive discharges from individual proposed construction sites. The results of these reviews may determine that new or expanded existing engineered stormwater components (drains, culverts and above and underground piping systems) are required to allow proper drainage during and after precipitation events, and prevent erosion and localized flooding. Potential contamination from parking lots can also result if spills or leaks from vehicles occur and are permitted to enter the stormwater system. These materials can also be transported via stormwater runoff. Potential effects on stormwater would be considered both direct and indirect, as the capacity of stormwater system components on and off-base could be exceeded by increased stormwater runoff. In addition, particulates and/or other contaminants (leaked or spilled HAZMATs) that enter the stormwater system on-base can be transported and impact stormwater quality within Buckley AFB boundaries, as well as off-base in downstream receiving streams.

The Buckley AFB USEPA NPDES Storm Water Multi-Sector General Permit for Industrial Activities should be reviewed and amended appropriately if proposed CIP projects would affect the contents and/or create new or additional system or discharge inspection, BMP implementation, sampling or monitoring requirements. In addition to permitting construction activities, under this permit, Buckley must ensure that controls are in place to prevent or

minimize water quality impacts after construction is complete. These controls should be included in the design of the facility.

The Buckley AFB SWPPP may require updating as demolition and construction activities proceed. Demolition of structures and/or ground disturbance performed at locations could affect the integrity of stormwater conveyance devices and structures. More intense and/or more frequent inspections of these components may be required. In addition, proper storage of HAZMATs used at construction and demolition sites would need to be insured, and the SWPPP may need to be amended to include locations used to store HAZMATs throughout implementation of the Proposed Action.

Increased stormwater loads could result in exiting stormwater infrastructure components being hydraulically overwhelmed, and increased concentrations of particulate matter and other contaminants (from construction areas and parking lots) being carried and discharged into receiving streams and waterbodies on and off-base. However, the application of BMPs discussed in Section 4.3.11.1, BMPs associated with the USEPA NPDES Permit, and site-specific engineering plans that would be developed for construction projects would provide adequate safeguards to eliminate or minimize impacts to a level considered insignificant.

#### **4.3.11.3 Groundwater**

The Proposed Action would have a limited and negligible affect on groundwater. As discussed in Sections 4.3.11.1 and 4.3.11.2, the increase in impervious surfaces that would result from the Proposed Action would increase stormwater runoff and discharges. Assuming that 100 percent of the increased runoff caused by the loss of pervious surfaces is discharged as stormwater, there would be a loss of 99.42 mgy that had previously been infiltrating and recharging the aquifers underlying Buckley AFB. However, depending on hydrogeologic conditions, stormwater runoff that reaches the three receiving streams can recharge groundwater directly from the stream channel. Potential effects on groundwater would be considered indirect, as the loss of water infiltrating and recharging aquifers underlying Buckley AFB would potentially have impacts reaching beyond Buckley AFB boundaries. Ultimately, the Proposed Action would not be expected to significantly impact groundwater resources.

#### **4.3.11.4 Cumulative Impacts**

The geographic area evaluated for cumulative impacts on water resources includes the City of Aurora. Cumulative impacts on water resources (surface water, stormwater, and groundwater) would be created by the Proposed Action in combination with the increased utilities consumption and discharges resulting from other development in the vicinity of Buckley AFB. The potential cumulative impacts on water resources off-base would be similar to those described for Buckley AFB in Section 4.3.11 (i.e. erosion, contaminated runoff, spills, increased impervious surfaces and stormwater loading). The City of Aurora anticipates development of residential areas at approximately 1,800 new residential units per year. Assuming the new residential units average 2,000 ft<sup>2</sup> per unit, the growth rate would equal approximately 3.6 million ft<sup>2</sup> of building space per year. Office and industrial development is also projected to grow at a rate of 210 acres (9,147,600 ft<sup>2</sup>) annually. Retail and commercial development would comprise approximately 20 acres per year (871,200 ft<sup>2</sup>).

##### **Surface Water**

The majority of the City of Aurora that could be developed that surrounds or is in proximity to Buckley AFB is also located within the South Platte River drainage basin. As with development on-base, City of Aurora development off-base could impact surface water during the ground disturbance phase of construction activities, including surface water contamination due to erosion, increased particulates, turbidity, and transport of particulate matter via stormwater runoff. These effects would be considered to be direct and indirect. The common BMPs for construction and demolition activities listed in Section 4.3.11.1 would be expected to be practiced at off-base City of Aurora project sites to minimize erosion and minimize potential affects of storage, handling and use of fuels, oils and other hazardous liquids.

Once completed, operation of completed City of Aurora structures and facilities would increase the impervious surfaces throughout the regions of development. Roofs, parking lots, sidewalks and walking paths would all reduce the areas in which precipitation can infiltrate the earth surface. Table 4.28 shows estimated increases in impervious areas anticipated from implementing the Proposed Action and City of Aurora development.



<b>Table 4.28: Cumulative Increased Impervious Surface Calculations</b>			
<b>Year</b>	<b>Buckley AFB Increased Impervious Surfaces (Acres)</b>	<b>City of Aurora Increased Impervious Surfaces (Acres)<sup>(1)</sup></b>	<b>Cumulative Increased Impervious Surfaces (Acres)</b>
2002	15	452	468
2003	38	1,121	1,159
2004	54	1,681	1,735
2005	45	2,242	2,286
2006	11	2,802	2,813
2007	5	3,363	3,367
2008	7	3,923	3,930
2009	48	4,483	4,532
2010	-3	5,044	5,040
TBD <sup>(2)</sup>	21	5,604	5,625
<b>Totals</b>	<b>240</b>	<b>30,715</b>	<b>30,955</b>

(1) Assumptions related to City of Aurora development and increased impervious surfaces are as follows:

- City of Aurora Residential Growth Rate = 1,800 units per year
- Average Residential Size = 2,000 ft<sup>2</sup> per unit
- City of Aurora Business Office and Industrial Growth Rate = 9,147,600 ft<sup>2</sup> per year
- City of Aurora Retail and Commercial Growth Rate = 871,200 ft<sup>2</sup> per year.

(2) TBD = To Be Determined for projects scheduled beyond 2011 (year of completion currently unknown/unspecified).

As shown on Table 4.28, the cumulative increase the impervious surfaces due to Buckley AFB and City of Aurora development would total approximately 30,955 acres. The on-base impervious surface total area would increase to a total of 652 acres, an increase of 58 percent. The Proposed Action would result in 20 percent of the total 3,283 acre drainage area at Buckley AFB being impervious surface. Information related to the current impervious land area in the city was sought from the City Aurora. Although the information was not available, it is known that the total area of the City of Aurora is 142.7 square miles (91,328 acres), of which 0.2 square miles (128 acres) is water (streams, lakes, and ponds). Using these numbers, planned City of Aurora development would convert 27.5 percent of the total city area to impervious surfaces (excluding water area). The percentage increases to 27.8 percent when the Buckley AFB

increased impervious surfaces are included in the calculation. As with Buckley AFB, the City of Aurora has extensive natural and man-made surface drainage as well as underground storm drainage lines that would convey increased stormwater volumes created from increased impervious surfaces. Some of the stormwater infrastructure components may need to be upgraded to facilitate increased stormwater flows.

### **Stormwater**

City of Aurora development in proximity to Buckley AFB could impact surface waters including Box Elder Creek, First Creek, Sand Creek, Granby Ditch, Westerly Creek, Murphy Creek, Cherry Creek, Cherry Creek Reservoir, Meadowood Creek, Quincy Reservoir, West and East Tollgate Creek, Unamed Creek, Senac Creek, Aurora Reservoir, and Coal Creek. Of these surface waters, East Toll Gate Creek, Sand Creek and Murphy Creek receive flows from Buckley AFB. Cumulative impacts from Proposed Action and City of Aurora development would likely increase the volume of stormwater runoff received some, if not all, of the surface waters identified.

Cumulative impacts from ground disturbance related to construction and demolition activities can impact stormwater discharges in the same manner as those described in Section 4.3.11.2. A NPDES stormwater CGP may be required for off-base construction projects if they exceed the one acre threshold (see section 4.3.11.2).

Operation of the completed buildings, parking lots, sidewalks and walking paths would create the additional runoff volume. Table 4.29 provides estimates for cumulative stormwater discharge increases.

<b>Table 4.29: Cumulative Increased Stormwater Loading Calculations</b>			
<b>Year</b>	<b>Buckley AFB Increased Stormwater Loading (Million Gallons)</b>	<b>City of Aurora Increased Stormwater Loading (Million Gallons)*</b>	<b>Cumulative Increase in Increased Stormwater Loading (Million Gallons)</b>
2002	6	187	193
2003	16	464	480
2004	22	696	718
2005	18	928	946
2006	4	1,160	1,164
2007	2	1,391	1,393
2008	3	1,623	1,626
2009	20	1,855	1,875
2010	-1	2,087	2,086
TBD <sup>(2)</sup>	9	2,319	2,328
<b>Totals</b>	<b>99</b>	<b>12,710</b>	<b>12,809</b>

(1) Assumptions related to City of Aurora development and increased impervious surfaces are as follows:

- City of Aurora Residential Growth Rate = 1,800 units per year
- Average Residential Size = 2,000 ft<sup>2</sup> per unit
- City of Aurora Business Office and Industrial Growth Rate = 9,147,600 ft<sup>2</sup> per year
- City of Aurora Retail and Commercial Growth Rate = 871,200 ft<sup>2</sup> per year.

(2) TBD = To Be Determined for projects scheduled beyond 2011 (year of completion currently unknown/unspecified).

Once construction projects are completed a cumulative increase of approximately 30,955 acres of impervious surfaces is expected. Assuming an annual precipitation rate of 15.24 inches per year and no losses due to evaporation, the anticipated increase in stormwater due to the Proposed Action would be approximately 12,809 mgd. It is not possible to determine the exact direction and volume of increased runoff off-base since the areas that will be developed are currently unknown and no studies or information are available. As with impacts on-base, off-base development may cause increased stormwater loads that could result in exiting stormwater infrastructure components being hydraulically overloaded, and increased concentrations of particulate matter and other contaminants being carried and discharged into receiving streams and waterbodies off-base. However, existing zoning and permitting requirements would require

studies to be conducted prior to construction, and therefore, resulting impacts would not be expected to be significant.

### **Groundwater**

The cumulative affect on groundwater would be moderate. As discussed earlier in this Section, the cumulative increase in impervious surfaces that would result from the Proposed Action and City of Aurora development would increase stormwater runoff and discharges. Assuming that 100 percent of the increased runoff caused by the loss of pervious surfaces is discharged as stormwater, there would be a loss of 12,809 mgd that had previously been infiltrating and recharging the aquifers underlying the area considered. However, depending on hydrogeologic conditions, stormwater runoff that reaches the three receiving streams can recharge groundwater directly from the stream channel. Potential effects on groundwater would be considered indirect, as the loss of water infiltrating and recharging aquifers underlying the area considered would potentially have impacts reaching beyond the area of consideration. Ultimately, cumulative impacts on groundwater would not be expected to be significant.

### **4.3.12 Floodplains and Wetlands**

The East Tollgate and Sand Creeks 100-year floodplains border several of the ADPs and ELUAs on the south-central and northeastern portions of Buckley AFB. Low-lying drainages and tributaries to East Tollgate Creek located in the Dormitory, 460th SW Headquarters, and Industrial Support ADPs are characterized by several types of riparian emergent and shrub-scrub wetlands. Other low-lying areas and drainages surrounding Williams Lake, or that drain to Sand Creek also contain potential wetlands.

#### **4.3.12.1 Floodplains**

Floodplains occur in the southwestern and northeastern corners of the base. The northeastern corner of the base is not directly associated with the Proposed Action site locations; therefore, no direct impacts to floodplains would occur within the Sand Creek 100-year floodplain. Vegetated filtration areas and other open spaces developed within the Williams Lake ADP would remove sediments and pollutants prior to surface water runoff entering the lake. Small amounts of sediments or pollutants indirectly affecting surface waters would settle out prior to entering the Sand Creek 100-year floodplain.

The Privatized Housing ADP is located on the northeastern side of the East Tollgate Creek 100-year floodplain. Stormwater runoff generated by developing this area would drain into Tollgate Creek. A portion of potential pollutants would be removed through natural infiltration. Site design and BMPs such as extended detention ponds, parking lot infiltration trenches, landscaped open space, and vegetated filter strips would be used to minimize any potential indirect adverse effects from increased flows within the Sand Creek and the East Tollgate Creek 100-year floodplains.

#### **4.3.12.2 Wetlands**

Wetlands are distributed along several un-named tributaries and drainages of East Tollgate Creek in the northern area of the Dormitory ADP (South Section), the southwestern portion of the Privatized Housing ADP, west of the Headquarters Area ADP, and north of the Industrial Support ADP. Intermittently distributed wetlands also occur throughout the drainages surrounding Williams Lake shown in the Williams Lake ADP (see Figures 3.5 and 4.6).

Potential wetland areas are located within the open spaces, stream corridors, natural grasslands, or flood basins planned within these ADPs. The ADPs indicate that most of these wetlands would remain undisturbed. A few of these wetlands are within an existing road corridor or recreation area where landscape improvements are planned.

Potential for direct disturbance to wetlands, Waters of the United States (WOUS), and riparian vegetation would be limited to tributaries of East Tollgate Creek. Minor site grading could affect bottomland wet meadows on the northwestern side of Williams Lake. Potential for disturbance to wetlands are as follows:

- Drainage improvements on Aspen Street and the extension/realignment of Beaver Creek Street crossing several tributaries of East Tollgate Creek.
- Minor surface grading to construct the golf driving range at the headquarters, recreation facilities at Williams Lake, and portions of the MFH.

Small amounts of WOUS, palustrine emergent, bottomland meadow, and cottonwood wetlands may be directly affected as roads and recreational facilities are upgraded. If necessary, the process of wetland delineation would proceed. USAF policy follows the no net loss of wetlands and where feasible, the quality of the wetland resources would be enhanced without

adversely affecting the operational requirements at Buckley AFB. Therefore, no long-term adverse impacts to wetlands are expected from the Proposed Action.

#### 4.3.13.3 Cumulative Impacts

The area evaluated for cumulative impacts include all intermittent and perennial streams, and jurisdictional wetlands adjacent to and within the Sand Creek and East Tollgate Creek, including the limits of the 100-year floodplains located on Buckley AFB and that portion which lies within a 100-foot setback from the Buckley AFB Boundary (see Figures 3.5 and 4.6).

Table 4.30 shows the distribution of flood zones within the 511-acre cumulative evaluation area. Of this, nearly 61 percent of the 100-year floodplain is Flood Zone AE and the remaining 39 percent is Zone X.

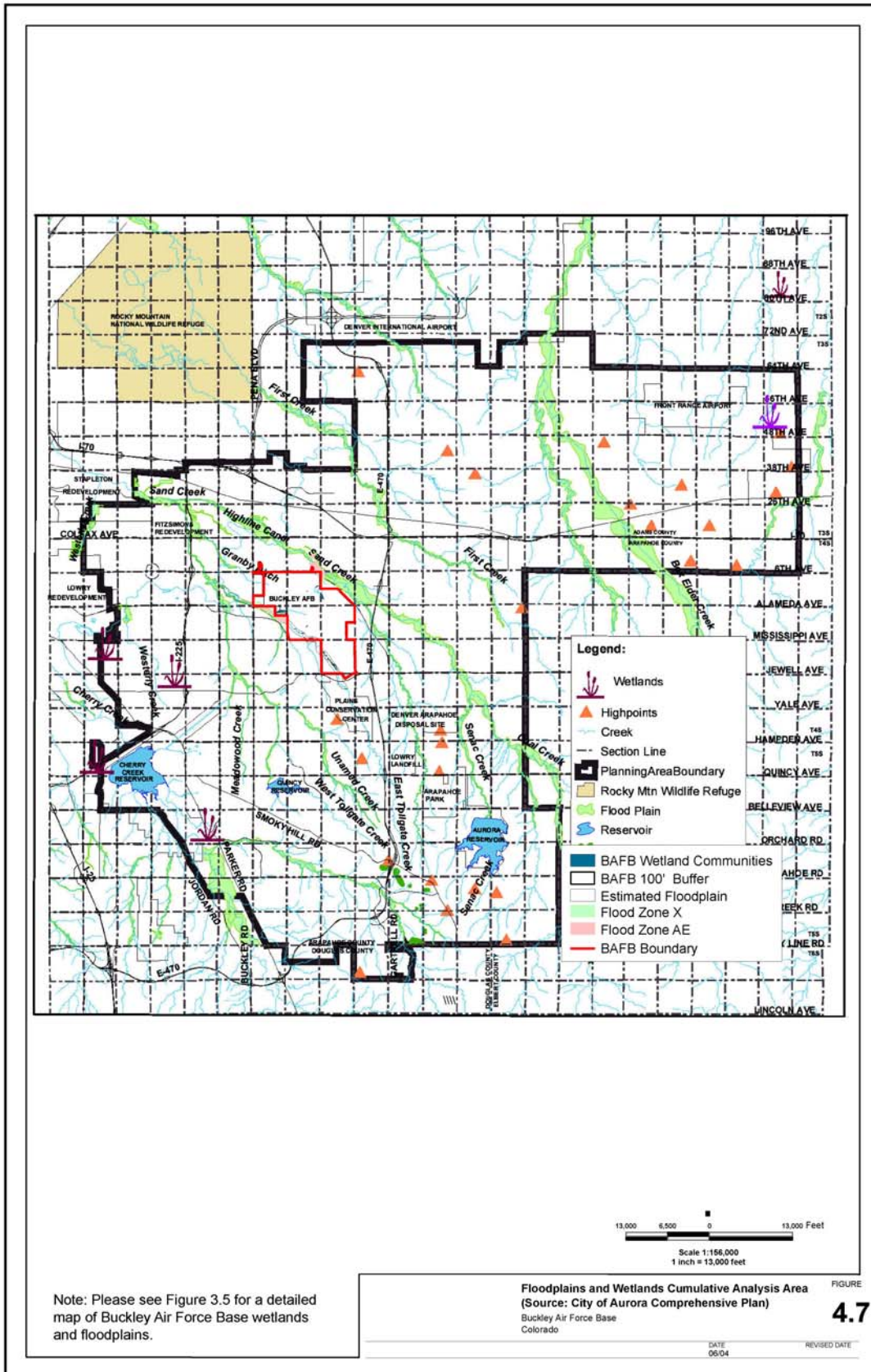
<b>Table 4.30: Flood Zones within the Cumulative 100-Year Floodplain</b>				
<b>Floodplain</b>	<b>Flood Zone X (acres)</b>		<b>Flood Zone AE (acres)</b>	
	<b>Buckley AFB<sup>1,2</sup></b>	<b>100 ft Setback</b>	<b>Buckley AFB<sup>1,2</sup></b>	<b>100 ft Setback</b>
East Toll Gate Creek	72.2	109.4	153.4	79.8
Sand Creek	3.7	12.8	16.4	63.7
Sub total	75.9	122.2	169.8	143.5
<b>Total</b>	<b>198.1</b>		<b>313.3</b>	
<b>Percent</b>	<b>0.39</b>		<b>0.61</b>	

- (1) Acreage directly from Flood Insurance Rate Map (1995); study limits terminated at the Buckley AFB west central boundary.
- (2) Acreage is extrapolated from FEMA study area and projected onto the remaining 100-year floodplain limits provided by Buckley AFB.

New development would both increase and decrease the percent of impervious surface on Buckley AFB (due to construction and demolition), and lands bordering the base. The Colorado Water Conservation Board (CWCB) may designate and approve new storm or floodwater runoff channels or basins reducing any potential flood hazards in local communities. Nine drainage improvement projects ranging from erosion control to detention ponds are planned within the Sand and Tollgate Creeks (City of Aurora 2003). Incremental increases in stormwater runoff

would be controlled through the City of Aurora's CIP and other drainage control measures required for new development. Flooding or channel instability downstream from new development sites within the City of Aurora would be reduced through implementation of these drainage controls.

The five wetlands identified within the City of Aurora are not located downstream or immediately adjacent to Buckley AFB (City of Aurora, 2003). Other potential wetland areas that have not yet been field verified may be located within the open spaces, stream corridors, natural grasslands, or planned flood basins. Additional wetlands and riparian vegetation could be created throughout these tributaries as drainageways are landscaped and wetland preservation plans are implemented.





Buckley AFB plans to phase the development and demolition plans of base facilities. Incremental increases in impervious surface from new development would be partially off-set by demolition of 30 facilities totaling 14.05 acres. Phased construction would generate minor incremental increases in impervious surface on Buckley AFB. Existing underground piping and swales would channel storm water runoff away from portions of the installation undergoing development. Some surface water discharge from the installation drains into onsite stormwater management ponds and some drain into East Tollgate and Sand Creeks. Existing stormwater management ponds would accommodate small portions of new stormwater runoff but increased peak flows draining directly into these streams would enter these creeks without retention. Future drainage systems would be designed to control the peak rate of discharge from developing properties for the 100-year 24-hour event to levels that would not cause an increase in flooding or channel instability downstream when considered in aggregate with other developed properties and downstream drainage capacities.

No significant cumulative impacts to wetlands are expected from the Proposed Action. If on or off-base project locations change such that impacts may occur the process of wetland delineation would proceed.

#### **4.3.13 Radon**

Depending on the location and type of construction of the Proposed CIP EA buildings radon issues could result. Newly constructed buildings would be designed and constructed to prevent radon build-up, therefore no radon impacts would be expected. If the presence of radon is suspected completed structures would be monitored for radon. If structures show radon levels over 4.0 pCi/l appropriate radon reduction actions would be implemented. Potential radon effects would be considered direct, however, with proper building design and construction impacts from radon would be considered insignificant.

##### **4.3.13.1 Cumulative Impacts**

The geographic area evaluated for radon cumulative impacts includes the City of Aurora. The nature of potential cumulative impacts related to radon would be similar to those described for the Proposed Action at Buckley AFB in Section 4.3.13. However, impacts could be increased for the City of Aurora because the scope of magnitude of development is many times of that planned for Buckley AFB alone. As with construction of new facilities at Buckley AFB, radon

issues related to the development within the City of Aurora would depend on the location and type of construction. Completed structures may be monitored for radon if its presence is suspected. If structures show radon levels over 4.0 pCi/l appropriate radon reduction actions would be implemented. Potential radon effects would be considered direct, however, with proper building design and construction impacts from radon would be considered insignificant.

#### **4.3.14 Lead-Based Paint**

No LBP would be used in construction of Proposed CIP EA buildings.

Potential LBP effects associated with the Proposed Action would be considered direct. If proper abatement procedures are followed, there would be no significant impacts from LBP with respect to the Proposed Action.

##### **4.3.14.1 Cumulative Impacts**

The geographic area evaluated for LBP cumulative impacts includes the City of Aurora. As with construction of new facilities at Buckley AFB, LBP would not be expected to be used in construction of City of Aurora developments.

The nature of potential cumulative impacts related to LBP would be similar to those described for the Proposed Action at Buckley AFB in Section 4.3.14. The City of Aurora has established a LBP Program (under the Community Development Division), which includes surveys for LBP. If the presence of LBP is confirmed the associated hazards would be abated in accordance with applicable federal, state, and local regulations prior to the demolition of the buildings. Potential cumulative LBP effects associated with the Proposed Action and City of Aurora development would be considered direct. If proper abatement procedures are followed, there would be no significant impacts from LBP.

#### **4.3.15 Asbestos**

The potential exists for either finding asbestos wrapped pipes or asbestos contaminated soil during construction. In particular, this may be the case for the sites scheduled for the CDC and the athletic fields, but may also apply at other construction and demolition sites. Other Proposed Action projects are not located in areas where World War II era structure demolition projects took place. Therefore, it is unlikely that historic asbestos contaminated soils or other components would be encountered while conducting construction/demolition activities in the

vicinity of these projects. In addition to buried historical ACM that may be encountered during excavation activities, some of the structures scheduled for demolition may contain asbestos insulation and/or floor/ceiling tiles. In particular, Building 19 is believed to contain asbestos insulation.

If unexpected ACM is encountered during any construction or demolition activity, the activities would be terminated immediately and measures would be taken to secure the area and prevent the release of ACM. The base would take the appropriate measures and all local, state, and federal regulations would be followed for proper remediation and disposal.

The ROI for ACM is considered to be the construction and demolition sites or its immediate surroundings where airborne asbestos fibers might be sufficiently concentrated to be inhaled in harmful quantities. Potential effects of ACM encountered during Proposed Action activities would be considered direct. However, if asbestos is encountered, and remediation and disposal proceed according to all regulations, impacts would be insignificant.

#### **4.3.15.1 Cumulative Impacts**

The geographic area evaluated for asbestos cumulative impacts includes the City of Aurora. The nature of potential cumulative impacts related to asbestos would be similar to those described for the Proposed Action at Buckley AFB in Section 4.3.15. Any demolition or renovation projects conducted within the City of Aurora would require asbestos abatement. All local, state, and federal regulations would need to be followed for proper remediation and disposal.

Potential effects of ACM encountered during demolition activities within the City of Aurora would be considered direct. However, it is anticipated that reputable contractors will perform construction and demolition project on and off-base, and if asbestos is encountered experts would be engaged to perform appropriate abatement activities. In addition, it is expected that if asbestos is encountered during construction and/or demolition activities the CDPHE would be consulted and all local, state, and federal regulations would be followed for proper remediation and disposal. For these reasons cumulative impacts related to asbestos would be considered insignificant.

#### **4.3.16 Noise**

The federal noise measure used for assessing total daily noise exposures in communities is the DNL. Most people are exposed to sound levels of 50 to 55 DNL or higher on a daily basis. The primary human response to environmental noise is annoyance. The degree of annoyance has been found to correlate well with the DNL. Several social surveys have been conducted in which people's reaction to their noise environment has been determined as a function of DNL occurring outside their homes. Guidelines have been developed for individual land uses based upon the information collected in these surveys and upon information concerning activity interference.

Noise impacts from the Proposed Action are a function of construction and demolition activities. Noise created from construction and demolition activities could have short-term on and off-site direct effects. The highest calculated cumulative energy equivalent sound levels from construction activities are estimated to be 85 dB at 50 ft from the center of the project site. Noise levels at 50 ft for some equipment used during construction and demolition activities are: 80 dB for bulldozers, 83 dB for cranes, 85 dB for backhoes, and 91dB for trucks.

The impacts from noise would vary according to the activity occurring on any given day and impacts would cease when construction and demolition is completed. There may be nearby adjacent receptors to experience noise impacts from certain demolition and construction sites. However, noise impacts from the Proposed Action would not greatly increase ambient levels, be short-term, and would discontinue after demolition, site grading and construction are complete. Construction and demolition activities may need to be restricted to day-time hours only. However, the effects of noise during the construction and operation of the Proposed Action would be expected to be moderate and would be consistent with acceptable noise levels on an active USAF base.

The location of the completed buildings and structures are within the 65 dB contour, therefore the individuals working or frequenting these facilities would not be ill affected by noise associated with aircraft/airspace operations. The effects of noise resulting from the Proposed Action would not be significant.

#### **4.3.16.1 Cumulative Impacts**

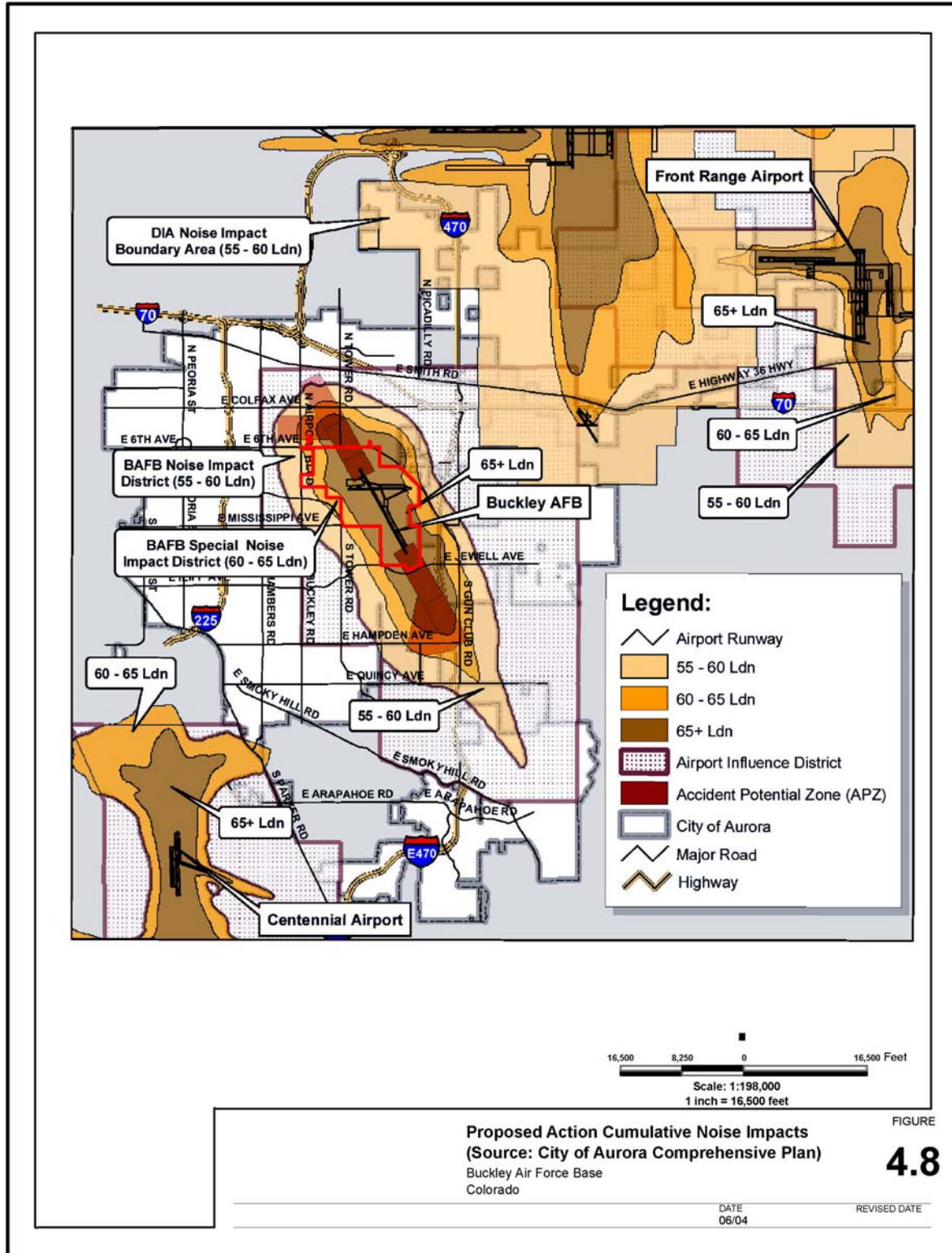
The area evaluated for cumulative noise impacts encompass the geographic extent of the existing Buckley AFB noise contours. The proximity and relationship of the Buckley AFB to adjacent airfields is also considered (see Figure 4.8).

The Proposed Action would have a short-term adverse cumulative effect as a result of noise associated with construction and a long-term cumulative impact associated with regular airbase and traffic operations within the region. These cumulative impacts would be negligible, with the construction impacts likely to be more intense.

Cumulative effects on ambient noise levels would be consistent with rapid light industrial and mixed-use development in an urban area. The only potential exception would occur during the actual construction for the development of the ADPs and ELUAs. CIP project construction is likely to be in active construction in varying intensities from 2004 through 2007 with fewer projects thereafter. The development of the ADPs would be concurrent with construction at the Fitzsimons Redevelopment area. As a result, there could be a negligible cumulative adverse impact on the ambient soundscape. The attenuation of noise over the distance and topography between the two sites would minimize this potential cumulative adverse effect.

The cumulative effects of rapid urban and transportation development combined with regional airport operations would have a moderate adverse cumulative impact on the local community. The introduction of increased human-caused noise levels would potentially result in a cumulative increase in impacts to the regional soundscape in conjunction with other plans and projects.

However, the attenuation of sound over distance and the phasing of development activity associated with other projects in the vicinity would reduce and minimize this potential cumulative effect on the local community. In general, there would be few if any projects other than regular airport operations and maintenance that would contribute to a cumulative effect on the urban environment.



#### **4.3.17 Safety**

Implementation of the Proposed Action would not result in any changes to Buckley AFB standard work safety practices. An adequate level of safety would be maintained during implementation of the Proposed Action as required by all applicable local, State and Federal regulations. Thus, implementation of the Proposed Action would not result in significant impacts to safety on Buckley AFB.

##### **4.3.17.1 Cumulative Impacts**

The Proposed Action would take place within the current boundaries of Buckley AFB. The Proposed Action would consolidate interdependent operations and improve compatibility of airbase operations. The Proposed Action increases the safety and security of the installation and surrounding community by conforming to force protection and surveillance.

#### **4.3.18 Pollution Prevention**

The pollution prevention techniques detailed in Section 3.20 would be followed. Thus implementation of the Proposed Action would result in a lower usage of virgin raw materials (through purchasing of materials with recycled content); less material being sent to local landfills (through separation and recycling of materials); and lower usage of water, natural gas and electricity (through building “green” methods) than if pollution prevention techniques were not practiced. Therefore the use of pollution prevention techniques would have a beneficial impact when compared to implementing the Proposed Action without consideration for pollution prevention.

##### **4.3.18.1 Cumulative Impacts**

Regionally, current proposed or ongoing residential, commercial, and light industrial developments within the City of Aurora would affect up to 5,952 acres of land by 2010. Compared to the extent of regional development, the Proposed Action would contribute less than 10 percent to potential cumulative pollution. If pollution prevention is practiced on a cumulative basis (on- and off-base) less virgin raw materials would be used in construction; less water, natural gas and electricity would be used for final facilities operations; and less material from construction and demolition activities would be sent to local landfills than if pollution prevention techniques were not practiced. Therefore the use of pollution prevention techniques would have

a beneficial impact when compared to implementing of the same projects without consideration for pollution prevention.

#### **4.3.19 Environmental Justice**

No adverse environmental impacts are anticipated as a result of the proposed construction and demolition projects. Because there are no adverse impacts, then there would be no disproportionate adverse environmental impacts on minority or low-income populations. The Proposed Action effects on biological resources would not affect minority/low-income areas because subsistence foraging does not occur on the installation. Water resource impacts would be negligible on minority/low-income areas if BMPs and discharge permits are followed. Asbestos, hazardous waste, HAZMATs, noise, lead-based paint, radon impacts are negligible for surrounding minority/low-income areas if BMPs are employed. Impacts on minority/low-income areas resulting from air emissions, impacts on soils, historic structural resources, visual aesthetics, land use, socioeconomics, utilities, floodplains and wetlands, safety, and pollution prevention measures would be negligible, as these resources are generally confined within the boundaries of Buckley AFB or would not otherwise impact these populations. Traffic increases as a result of the Proposed Action would cause increases in peak-hour arterial traffic volumes, but would not cause systemic traffic flow changes within adjacent minority/low-income areas. Operation of the Munitions and Hazardous Materials Gate would eliminate the current circumstance where HAZMAT deliveries are entering the facility adjacent to a residential area. Implementation of the Proposed Action would reduce the potential for spills or other incidents related to delivery of HAZMATs in or around residential areas, presenting potential direct and indirect positive effects.

Although several minority/low-income areas exist adjacent to Buckley AFB, the Proposed Action construction and demolition projects would be occurring in areas within the base that are generally buffered from the public. Areas where development would interface more directly with facilities and infrastructure accessed and populated by the public include the Privatized Housing ADP (bordering on Airport Boulevard and the planned Aurora City Park at the western edge of the base), the Entry Gates and Dormitory ADPs (bordering on 6<sup>th</sup> Avenue at the northern extreme of the base and the eastern installation boundary), and the William Lake ADP (at the northern installation boundary). Although the construction and finished facilities contained in



these ADPs would be developed in areas that may be visible to the public, the nature of the development projects (housing units, athletic fields, and picnic and camping facilities) are consistent with typical community features and would not create an adverse impact. Other military-oriented Proposed Action projects would be constructed further within the base boundaries and would be buffered from the public by distances adequate to insure no resulting adverse impacts.

#### **4.3.19.1 Cumulative Impacts**

The geographic area evaluated for environmental justice cumulative impacts includes the City of Aurora and Arapahoe County. Potential environmental justice impacts related to the development within Buckley AFB were described in Section 4.3.19. Additional environmental justice impacts could result from development of currently undeveloped areas or redevelopment of areas that are currently idle or not in use surrounding Buckley AFB. Potential environmental justice impacts that could result from development or redevelopment within the county would be regulated by existing zoning area use designations, laws and permitting requirements. Existing zoning area use designations, laws and permitting requirements would be sufficient to ensure that minority/low-income populations would not be impacted by development. In the event that conflicts arise from development plans within the county, the public hearing process would be invoked to resolve issues. The public hearing process would serve to ensure that minority/low-income population concerns are heard and considered and appropriate decisions are made to eliminate environmental justice impacts.

### **4.4 ALTERNATIVE ACTION 1: CONSTRUCT ADPS 1, 2, 3 AND 7**

#### **4.4.1 Air Quality**

Table 4.5 lists the cumulative annual emissions that would be increased as a result of the Proposed Action. If Alternative Action 1 were followed it is likely that the cumulative environmental impacts on air quality would be diminished by some degree. The actual reduction in air quality impacts would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced impacts to air quality would be calculated on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified, however impacts would remain insignificant under Alternative Action 1. The amount ODS that would be employed through Alternative Action 1 would also be

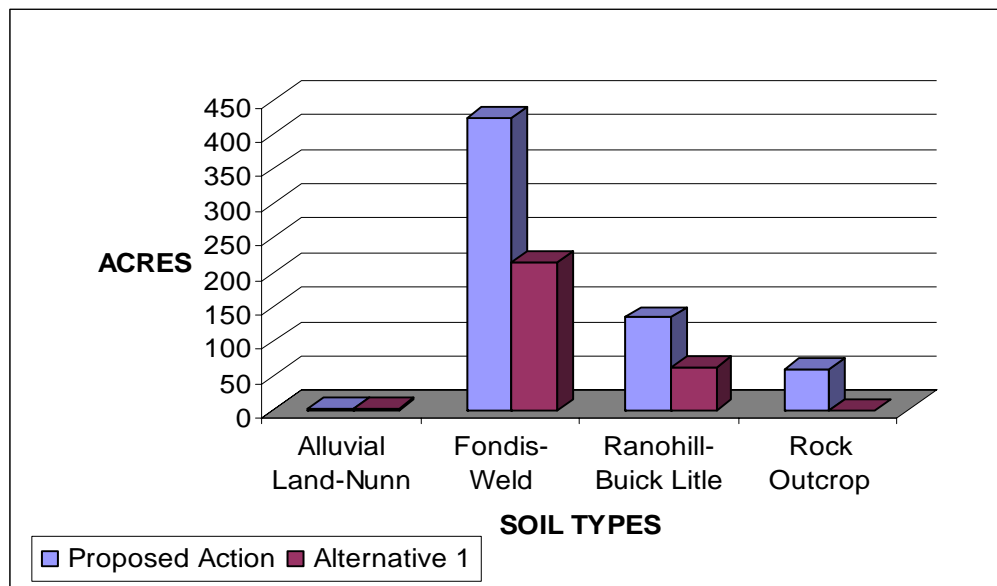
decreased. The extent of the decrease would again depend on to the number and extent of projects that would be time-delayed, downsized or not constructed.

#### **4.4.1.1 Cumulative Impacts**

Cumulative annual emissions increase impacts of the Proposed Action were presented in Section 4.3.1.7. If Alternative Action 1 were followed it is likely that the cumulative environmental impacts on air quality would be diminished by some degree. The actual reduction in air quality impacts associated with Alternative Action 1 would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts on air quality would be calculated on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing Alternative Action 1 on air quality would be less than those predicted for the Proposed Action and cumulative impacts would remain insignificant under Alternative Action 1.

#### **4.4.2 Soils**

Similar to the Proposed Action, most of the demolition and construction activity under Alternative 1 would take place on previously disturbed soils. Site grading and trenching would disturb proportionately more erosive than expansive soil types. There is less total soil disturbance under this alternative (see Figure 4.9).



**Figure 4.9: Distribution of Potential Soil Disturbance**

Impacts to soils would remain insignificant under Alternative Action 1

#### **4.4.2.1 Erosive Soils**

Alternative 1 would disturb 465 acres, or 27 percent less erosive soils than the Proposed Action. New construction would be planned to minimize ground disturbance to retain the maximum amount of undisturbed soils and vegetative cover.

With the use of conventional soil conservation and BMPs, construction-related effects to soils would be short-term, minor, adverse and local. Therefore, impacts from increased run-off on erosive soils would not be anticipated. Currently productive soil would be made unavailable for other purposes due to new coverage by expanded parking lots, sidewalks and buildings. New sidewalks would be planned and positioned to reduce social trailing. As a result, impacts to soils under Alternative 1, compared to the Proposed Action, would be long-term, local, and remain insignificant.

#### **4.4.2.2 Expansive Soils**

Similar to the Proposed Action, there would be little to no significant impacts due to construction within expansive soils under Alternative 1 (see Figure 4.9).

#### **4.4.2.3 Cumulative Impacts**

Similar to the Proposed Action, the incremental effect from future development of Alternative 1 on soil conditions would be indistinguishable from other types of urban development within the surrounding area. Silt fencing, temporary sediment basins, and other NPDES soil erosion control practices would reduce the small amount of soils lost during construction.

#### **4.4.2.4 BMPs**

Stormwater controls and implementation of BMPs would eliminate or minimize potential impacts due to development. BMPs would include implementing measures in and updating the SWPPP as required by the USEPA issued CGP.

#### **4.4.3 Hazardous Materials**

If Alternative 1 were followed the quantity of HAZMATs stored, handled, and used onsite would be decreased by some degree. The actual reduction in storage, handling, and use of HAZMATs would be related to the number and extent of projects that would be time-delayed, downsized or not constructed at all. The reduced impacts of hazardous material use would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified, however impacts would remain insignificant under Alternative Action 1.

##### **4.4.3.1 Cumulative Impacts**

Cumulative HAZMAT impacts of the Proposed Action were presented in Section 4.3.3.1. If Alternative Action 1 were followed it is likely that the cumulative environmental impacts created by hazardous material storage, handling and use would be diminished by some degree. The actual reduction in impacts associated with Alternative Action 1 would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts created through HAZMAT storage, handling and use would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of

implementing Alternative Action 1 created by hazardous material storage, handling and use would be less than those predicted for the Proposed Action and would remain insignificant.

#### **4.4.4 Hazardous Wastes**

The quantity of hazardous wastes generated onsite would be decreased by some degree if Alternative 1 were followed. The actual reduction in hazardous waste generation would be related to the number and extent of projects that would be time-delayed, downsized or not constructed at all. The reduced impacts of hazardous waste generation material use would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified and would remain insignificant under Alternative Action 1.

##### **4.4.4.1 Cumulative Impacts**

Cumulative hazardous waste impacts of the Proposed Action were presented in Section 4.3.4.1. If Alternative Action 1 were followed it is likely that the cumulative environmental impacts of hazardous wastes generated would be diminished by some degree. The actual reduction in impacts associated with Alternative Action 1 would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts of hazardous waste generation would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing Alternative Action 1 of hazardous waste generation would be less than those predicted for the Proposed Action and would remain insignificant.

#### **4.4.5 Historic Structural Resources**

Structures 801 and 909 would not be impacted under Alternative 1, as construction would not occur near buildings or create a landscape inconsistent with its historic setting after project completion.

#### **4.4.5.1 Cumulative Impacts**

Similar to the Proposed Action, there would be no adverse impact to a historic structural resource whose conservation is necessary to fulfill specific purposes identified in the *Colorado Preservation 2005 Plan* (Colorado Historical Society 2001). The USAF would continue to use measures to protect cultural resources. Cumulatively, Buckley AFB's structural historic resources would continue to derive appropriate protection within base boundaries. Outside of the base, effects on cultural resources could continue to be affected. Impact intensities would vary by resource type and accessibility, and would range in intensity at individual sites from negligible to minor. Regionally, the cumulative effect on cultural resources would be insignificant.

#### **4.4.6 Land Use and Aesthetics/Visual**

##### **4.4.6.1 Land Use**

Under Alternative 1, the same conceptual planning boundaries developed to consolidate and co-locate facilities with like or compatible land uses within the ADPs under the Proposed Action would be taken advantage of, however, to a lesser degree of completion. Under the Proposed Action development projects would occur within eight ADPs, while under Alternative 1 only four ADPs (ADPs 1, 2, 3 and 7) would be completed. However, the same related to Land Use would occur within the reduced number of ADPs completed. That being, completion of Alternative 1 would still serve to reorganize land use areas at the base, minimizing health, safety and security risks by placing similar facilities in close proximity to one another and segregating incompatible facilities.

The development that would take place within the four ADPs would improve organizational efficiencies, reduce travel distances and times, and potential exposure to hazards, however to a lesser degree than the Proposed Action.

As with the Proposed Action, some travel distances and times would be reduced through widening main thoroughfares and reconfiguring existing road systems. Transportation improvements such as deceleration lanes, pedestrian/bicycle paths, streetscapes, and future street access to the MFH area would be compatible with the City of Aurora's Comprehensive Plan.

Under Alternative 1, consolidation of facilities with like or compatible uses within appropriate land use designations would reduce residential areas being exposed to excessive

noise, similar to the Propose Action. As with the Proposed Action, building placement and height restrictions would remain compatible with USAF aircraft operations and designated clear zones under Alternative 1.

#### **4.4.6.2 Aesthetics/Visual**

Alternative 1 would provide scenic views and residential common land, playgrounds, and landscape enhancements similar to the Proposed Action except there would be no public outdoor recreation use and enjoyment at Williams Lake and the adjacent lands. Other than the Main Gate entrance, there would be no aesthetic improvements, such as streetscapes or landscaped enhancements along Aspen or Telluride Avenues. The visual aesthetics would be of a moderately landscaped installation lacking full integration between residential and administrative facilities. Therefore, as the residential, development progresses, there would be a moderate impact to creating a “*sense of community*” for those living on the base because transitional open spaces would not provide visual buffers to adjacent administrative and light industrial land uses.

#### **4.4.6.3 Cumulative Impacts**

In the short-term, there would be an improvement in the quality of the Buckley AFB work and living environment. As residential development occurs, more personnel would be living on-base and relying on local community recreation facilities. Over the long-term, community recreation facility crowding and over use would increase the rate of facility deterioration and maintenance requirements. Administrative and light industrial land uses on-base would not be visually buffered reducing the aesthetic value of residential development on and off-base.

The experience of Buckley AFB personnel and visitors would continue to be affected by the increased presence, density, and behavior of others. Noises from traffic and airfield operations would continue to be heard. Over the short-term as the phased development occurs, the cumulative effect would be similar to that described for the Proposed Action and most personnel and visitors would continue to have a good quality of life. Over the long-term as the development nears build-out, there would be a major reduction in the quality of life for those living on the base. Community services would be less convenient and personnel would spend more travel time seeking similar off-base community services.

#### **4.4.7 Environmental Justice**

The potential environmental justice impacts of the Alternative Action 1 would be identical to those of the Proposed Action, with the exception that the Williams Lake ADP would not be executed, thus the construction and finished facilities contained in this ADP would not be developed and would not be visible to the public.

##### **4.4.7.1 Cumulative Impacts**

The potential cumulative environmental justice impacts of the Alternative Action 1 would be identical to those of the Proposed Action, with the exception that the Williams Lake ADP would not be executed, thus the construction and finished facilities contained in this ADP would not be developed and would not be visible to the public.

#### **4.4.8 Utilities**

If Alternative 1 were followed the quantity of water, electricity and natural gas used would be decreased to some degree. In addition, the volume of wastewater generated would also be decreased by some degree. The actual reduction in use and generation would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced impacts on utilities would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified, however impacts would remain insignificant under Alternative Action 1.

##### **4.4.8.1 Cumulative Impacts**

Cumulative impacts of the Proposed Action on utilities were presented in Section 4.3.8.6. If Alternative Action 1 were followed it is likely that the cumulative environmental impacts on utilities would be diminished by some degree. The actual reduction in impacts associated with Alternative Action 1 would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts on utilities would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall



cumulative impacts of implementing Alternative Action 1 on utilities would be less than those predicted for the Proposed Action and cumulative impacts would remain insignificant.

#### 4.4.9 Biological Resources

If Alternative 1 were followed the impacts on biological resources would be decreased to some degree. The actual reduction in biological resources impacts would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced impacts on biological resources would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified, however cumulative impacts would remain insignificant under Alternative Action 1.

##### 4.4.9.1 Plant Communities

Under Alternative Action 1 ADPs 1, 2, 3 and 7 would be carried out. Table 4.31 shows the footprints of the areas that would be developed and the related footprints and plant habitats.

<b>Table 4.31: Plant Communities Observed or Characteristic Of ADPs and ELUs</b>			
<b>ADPs</b>	<b>General Location</b>	<b>Development Footprint (acres)</b>	<b>Existing Plant Community/Habitat (acres)</b>
1. Privatized Housing	Northwest quadrant	72	Mixed Grass Prairie
2. Entry Gates	North central quadrant	55	Crested Wheatgrass Ornamental Trees
3. Dormitory	Northwest quadrant	71	Crested Wheatgrass/small Mixed Grass Prairie Component Ornamental Trees

<b>Table 4.31: Plant Communities Observed or Characteristic Of ADPs and ELUs</b>			
<b>ADPs</b>	<b>General Location</b>	<b>Development Footprint (acres)</b>	<b>Existing Plant Community/Habitat (acres)</b>
7. 460th SW Headquarters	West-central quadrant	23	Crested Wheatgrass
Open Space ELUA	Eastern Periphery	8	Crested Wheatgrass/Mixed Grass Prairie
Aircraft Operations and Maintenance ELUA	Central quadrant	23	Weedy Forbs and Grasses/Crested wheatgrass
Airfield/Aircraft Pavement ELUA	Central quadrant	150	Crested Wheatgrass
Mission Operations and Maintenance ELUA	Northwest quadrant	44	Crested Wheatgrass
Industrial ELUA	North Central Quadrant	3	Weedy Forbs
6 <sup>th</sup> Avenue ELUA	Northern boundary	16	Crested Wheatgrass/Noxious Weeds
Special Operations ELUA	One south and one central location	0	Mixed Grass Prairie
<b>Total</b>		465	

Alternative Action 1 would result in the disturbance of approximately 465 acres of land at Buckley AFB. This acreage consists of a total of 72 acres of mixed grass prairie, 367 acres of crested wheatgrass prairie, and 26 acres of weedy forbs. Residual, but disturbed acreage that is not landscaped would be reseeded to restore the existing site-specific community, thus minimizing the loss of existing vegetation. The total disturbance is equal to 14.2 percent of the total installation area, and would create a minor, long-term impact on the vegetation.

#### 4.4.9.2 Noxious Weeds

Alternative Action 1 projects would result in a total ground disturbance of 465 acres over a 9 year period which could be invaded by noxious and other weed species if steps to re-vegetate these areas with desired plant species do not closely follow construction. BMPs that would be employed to thwart establishment of noxious weeds at project construction sites were presented in Section 4.3.9.2.

#### **4.4.9.3 Wildlife**

Alternative Action 1 would result in short-term animal displacements from a group of sites constructed in each FY. Alternative Action 1 would result in loss/displacement of animals from 465 acres. The short-term and long-term impacts on wildlife for Alternative Action 1 would be similar as those presented in Section 4.3.9.3 for the Proposed Action, however over a smaller area.

#### **4.4.9.4 Threatened/Endangered Species And Species Of Special Concern**

The short-term and long-term impacts on Threatened/Endangered species and species of special concern for Alternative Action 1 would be similar as those presented in Section 4.3.9.4 for the Proposed Action, however over a smaller area.

#### **4.4.9.5 Cumulative Impacts**

Cumulative impacts of the Proposed Action on biologic resources were presented in Section 4.3.9.5. If Alternative Action 1 were followed it is likely that the cumulative environmental impacts on biologic resources would be diminished by some degree. The actual reduction in impacts associated with Alternative Action 1 would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts on biologic resources would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing Alternative Action 1 on biologic resources would be less than those predicted for the Proposed Action and would remain insignificant.

#### **4.4.10 Traffic/Transportation**

While the number, size, and types of dormitory and family housing is similar to the Proposed Action, no additional community services facilities are proposed. There are also no changes to the street grid or any improvements to the internal circulation particularly along the primary and secondary roads.

#### 4.4.10.1 Demolition and Construction

During construction, portions of Aspen Street and Telluride would require temporary closure. Limited modifications to secondary roads adjacent to the project may result in short-term impacts to these streets. These impacts would be the same as described for the Proposed Action.

Table 4.32 Provides estimated debris hauling calculations for Alternative 1. Road upgrades to the existing street system would not be implemented under Alternative 1, therefore, less soil and debris would need to be excavated from the site than the Proposed Action. The duration of the demolition, construction, and hauling activity would be somewhat less than that for the Proposed Action. A construction transportation plan would be developed as needed to minimize potential impacts on the local street system.

<b>Table 4.32: Construction/Demolition Debris Handling Traffic – Alternative 1</b>			
<b>Year</b>	<b>Weight of Debris Generated (tons)</b>	<b>Volume of Debris Generated (yd<sup>3</sup>)</b>	<b>Number of Truck Trips Required</b>
2002	143	80	0.01%
2003	19,949	11,028	0.87%
2004	41,446	22,048	1.82%
2005	40,949	23,357	1.80%
2006	120,425	63,979	5.28%
2007	34	19	0.00%
2008	33,467	18,500	1.47%
2009	122,412	58,650	5.37%
2010*	160,546	83,562	7.04%
TBD	67,118	37,119	2.94%
<b>Totals</b>	<b>606,489</b>	<b>318,343</b>	<b>26.60%</b>

#### 4.4.10.2 ADP Trip Generation

Trip generation resulting from Alternative 1 is estimated based on the net increase in housing units and redevelopment or expansion of other community commercial, service, or light industrial facilities for ADPs 1, 2, 3 and 7 . Trip generation associated with the Alternative 1

land uses was estimated using ITE trip generation rates. Housing and dormitory trip rates per unit assumed in the Proposed Action analysis were also assumed for Alternative 1.

For purposes of this analysis, it was assumed that up to 90 percent of the vehicle trips generated by the community commercial, service and light industrial facilities would be generated by patrons or employees coming to and from areas outside of the project site. The remaining 10 percent were assumed to be related to on-site residents. Alternative 1 ADPs were reviewed to determine the percent of residential units within an 800-foot radius of the community service areas. Since no community service area improvements would be made, no housing units would be within walking distance of these community facilities, and no trips were deducted from the 10 percent of non-housing generated trips.

Table 4.33 summarizes the estimated new net trip generation for Alternative 1. Alternative 1 would generate slightly fewer vehicle trips than the Proposed Action. This is due to the lower number of dormitory units and less square-footage of community commercial and service improvements under this alternative.

<b>Table 4.33: Traffic Volume Impact – Alternative 1</b>			
<b>Category <sup>(1, 2)</sup></b>	<b>Daily Trips <sup>(3)</sup></b>	<b>AM peak Hour Trips</b>	<b>PM peak Hour Trips</b>
<b>ELU Baseline <sup>(4)</sup></b>	<b>65,493</b>	<b>6,244</b>	<b>7,401</b>
ADP-1 (Privatized Housing)	3,478	279	375
ADP-2 (Entry Gates)	1,809	163	206
ADP-3 (Dormitory)	4,569	357	490
ADP-7 (460th SW Headquarters)	1,347	178	236
All ELUAs	1,347	178	236
<b>Alternative 1 Trips</b>	<b>14,000</b>	<b>1,335</b>	<b>1,798</b>
<b>Total 2010 Trips</b>	<b>79,493</b>	<b>7,579</b>	<b>9,199</b>
<b>Percent Impact</b>	<b>21.38%</b>	<b>21.38%</b>	<b>24.29%</b>

- (1) Calculation spreadsheet provided in Appendix J.
- (2) Based on total market rate multi-family housing (ITE LU 230) and single family housing (ITE LU 210); community commercial (ITE LU 814); community service (ITE LU 495); Research and Development (Buckley AFB administrative) (ITE LU 760); and light industrial (ITE LU 110).
- (3) Trip generation rates given per 1,000 square foot of Gross Floor Area, unless otherwise noted (See Appendix J).
- (4) Based on existing land use acreage and 1 percent growth rate per year to 2010.

By comparing total traffic volumes for the 2010 ELU baseline and additional vehicle trips generated by Alternative 1, the percent traffic impact would increase 21.4 percent. But compared to the Proposed Action, Alternative 1 total daily traffic trip volumes would decrease by 10,479, a 42.8 percent decrease.

There would be no upgrades to the internal pedestrian connections or expanded community services under Alternative 1. The housing would not be located within walking distance of the community facilities. During the am peak hour there would be 540 fewer trips, 28.8 percent less than the Proposed Action. During the pm peak hour, there would also be a 24.5 percent decrease in traffic impact generated by Alternative 1. Average peak hour traffic delays would decrease as compared to the Proposed Action. At all other intersections a slight decrease in delay would be expected due to the additional traffic.

#### **4.4.10.3 Alternative Transportation**

Sidewalks would be provided along all streets internal to the Privatized Housing ADP and portions of Telluride Street to provide access to the youth soccer field. A centrally located north/south pedestrian connection would be provided in the vicinity of the proposed Visitors Center of the Entry Gates ADP and along Telluride Street, providing a connection from the housing areas to the BX/Commissary facilities. Pedestrian trails would be provided throughout the east/west portions to connect sidewalks along portions of Steamboat and Winterpark Avenues. Streetscape design features would be incorporated at key pedestrian street locations. These could include special pavement marking and/or textures, raised pedestrian crossways or other design measures.

#### **4.4.10.4 Installation Transportation**

New and reconstructed Community Commercial and Service, Industrial, and Housing development would be similar in use, size, location and construction to existing buildings as the Proposed Action. In Alternative 1, the Main Gate and Aspen Street would be improved up to its intersection with Steamboat Avenue, but there would be but no further street or intersection upgrades from that point.

Vehicular traffic would continue to access the installation through the Main Gate and Telluride Street Gates. The new Munitions and Hazardous Materials gate would be constructed

to improve future access to Steamboat Avenue for vehicles delivering these materials. Telluride Street would be extended to provide access to the MFH and residential roads but the West Gate would not be constructed.

#### **4.4.10.5 Main and Telluride Gates**

##### **Off-Base Traffic**

The gate selected by individuals commuting to Buckley AFB would depend primarily on their residential location in respect to the base and preferred travel routes. As with the Proposed Action, it was assumed that 90 percent of the additional traffic created by Alternate Action 1 would be off-base personnel that enter the base through the Main and Mississippi Gates. The remaining 10 percent of vehicle trips would be on-base personnel.

Approximately 668 new vehicle trips would enter the Main Gate during the peak morning hour. The Main Gate would see a total of approximately 3,790 peak morning hour inbound vehicle trips in 2010, an increase of 21.4 percent.

The number of vehicles traveling during the peak evening traffic hour west of the Main and Telluride Gates, on 6<sup>th</sup> Avenue, is projected to be approximately 3,450 vehicles during the peak hour. Assuming that three-quarters of the total 899 additional daily vehicle trips exiting the base through the Main Gate during the peak evening traffic hour travel west, this number would increase to approximately 4,124 vehicles at the peak hour, a 24.3 percent increase. Assuming that the remaining one-quarter, or 225 additional vehicle trips exiting the base during the peak evening traffic hour travel east, this number would increase to approximately 1,150 vehicles per hour, a 24.3 percent increase. However, this value represents a 24.5 percent impact decrease when compared to the Proposed Action. Off-base traffic at the new Telluride Gate would not be expected to be impacted significantly by Alternative Action 1, as this gate is primarily used to access the BX and Commissary.

Traffic proceeding to the base from E-470 exit 19 would turn east or west off the exit ramp on 6<sup>th</sup> Avenue Parkway, and travel south on Gun Club Road or Picadilly Road. From Gun Club Road, traffic would travel east on Bayaud Avenue, turning left onto Picadilly Road (south). Southbound traffic on Picadilly Road would turn right (northeast) on state Highway 30 (which turns into 6<sup>th</sup> Avenue) and access the Main Gate. Assuming that one-quarter of all new traffic

using the Main Gate daily would exit and enter the base to and from the east, and all of this traffic would be assumed to travel on E-470, traffic flow at exit number 19 would increase by 1,750 vehicles per day. The Buckley AFB contribution to entrance exit flow at E-470 exit number 19 would be 29.3 percent of total flow. Compared to the Proposed Action, Alternative 1 produces 42.8 percent less daily traffic volume.

With an 24.3 percent increase in off-base peak hour traffic on 6<sup>th</sup> Avenue in both the east and westbound directions, and an approximately 29.3 percent increase in daily trips at E-470 exit 19, the Proposed Action would create a minor increase in off-base traffic at the Main Gate.

### **On-Base Traffic**

Due to the proposed ADP development, it would be likely that the majority of resident personnel would proceed east on Breckenridge Avenue and south on Aspen Street until reaching the Headquarters Area or Industrial Support area. Employees would access parking lots directly from Aspen Street. Parents delivering children to the new CDC would proceed east on Breckenridge Avenue, turning right to reach the parking lot for the Center. Alternatively, parents dropping children off at the existing CDC would travel east on Breckenridge Avenue to Aspen Street; proceed north (turning left) on Aspen Street to Crested Butte Avenue; turn right (east) on Crested Butte; and turn left into the parking lot. In both cases parents would then proceed to the area on the base at which they work.

Traffic volumes at the Main Gate may have decreased in the recent past, due to the opening of the Telluride Gate. The increase in vehicles entering the Main Gate is estimated to be 7,000 vehicles per day. However, assuming an even distribution of vehicle trips during the peak morning hour, the increase in traffic entering the Main Gate would increase from 3,122 to 3,790 (a 21.3 percent increase).

The proposed widening at 6<sup>th</sup> Avenue and capability to open and operate two inbound processing lanes on Aspen Street would reduce off-base traffic impacts to 6<sup>th</sup> avenue. On-base road traffic in the vicinity of the Main Gate would increase by the 7,000 additional vehicle trips entering the installation (primarily traveling on Aspen Street). The proposed roadway improvements at the Main Gate and Aspen Street would provide some improvement to the increased peak hour traffic flow. But traffic flow at several intersections would be delayed



during peak am and pm hours. There would be a reduced capacity to handle this additional traffic.

#### 4.4.10.6 Mississippi Gate

##### Off-Base Traffic

Since all construction and demolition vehicles required to complete the Alternative 1 projects would access Buckley AFB through the Mississippi Gate, off-base traffic on Mississippi Avenue would increase throughout the phases of construction and demolition activities. The impacts would vary depending on the starting and ending dates of each of the projects. Calculations of the number of construction and demolition vehicles, as well as contractor employee personnel vehicles were estimated to make air emission calculations related to the Proposed Action (Section 4.3.1.2). Using these assumptions and considering one-half of the projects to be occurring simultaneously (a reasonable worst-case condition) the number of construction and demolition vehicles and personnel contractor employee vehicles that would be entering the Mississippi Gate off of Mississippi Avenue daily are shown on Table 4.34, below.

<b>Table 4.34: Construction and Demolition Vehicles Entering the Mississippi Gate – Alternative 1</b>			
<b>Year</b>	<b>Construction and Demolition Contractor Employee Traffic (Vehicles/Day)</b>	<b>Construction and Demolition Delivery Traffic (Vehicles/Day)</b>	<b>Total (Vehicles/Day)</b>
2002	8	32	40
2003	14	56	70
2004	18	72	90
2005	22	88	110
2006	34	136	170
2007	2	8	10
2008	6	24	30
2009	28	112	140
2010	6	24	30
TBD	16	64	80
<b>Totals</b>	<b>138</b>	<b>552</b>	<b>690</b>

Currently approximately 780 peak morning hour inbound vehicles pass through the Mississippi Gate. Using 2006 as a worst-case year and assuming that half the additional construction-related vehicles arrive during peak morning hours (as construction equipment and materials deliveries are likely to take place throughout the day), this number would increase to 865 vehicles, an 11 percent increase. West of the Mississippi Gate, Mississippi Avenue is a four-lane divided boulevard currently carrying 700 vehicles per hour on the road during peak traffic hours. Assuming that three-quarters of the total 85 additional construction-related vehicles exiting the base during the peak evening traffic hour travel west, this number would increase to approximately 764 vehicles per hour, a nine percent increase.

After the proposed ADP projects are complete 7,000 new vehicle trips would enter the base through the Mississippi Gate daily. The Mississippi Gate would see a total of approximately 668 additional peak morning hour inbound vehicle trips in 2010, an increase of 21.4 percent. Assuming that three-quarters of the total 899 additional vehicles exiting the base through the Mississippi Gate during the peak evening traffic hour travel west, the number of vehicles traveling west on Mississippi Avenue would increase to approximately 3,450 vehicles per hour. This is a 24.5 percent decrease in traffic volume over the Proposed Action.

Traffic proceeding to the Mississippi Gate from E-470 exit 16 would turn west on Jewell Avenue, then turn right (north) on Dunkirk Street or Tower Road. Dunkirk Street veers from north to east and becomes Mississippi Avenue, providing access to the Mississippi Gate. Traffic traveling north on Tower Road would turn right (east) onto Mississippi Avenue and access the Mississippi Gate. Assuming that one-quarter of all construction traffic would exit and enter the base to and from the east, and all of this traffic would travel on E-470, traffic at exit number 16 would increase to 2,943 vehicles per day (a 1.5 percent increase).

Assuming that one-quarter of all commuter traffic using the Mississippi Gate daily would exit and enter the base to and from the east, and all of this traffic would travel on E-470, traffic flow at exit number 16 would increase by 3,500 vehicles per day. The predicted traffic entrance exit flow at exit number 16 of E-470 would increase to 6,400 vehicles per day, with Buckley AFB contributing 54.7 percent to this flow. Alternative 1 would produce a 42.8 percent decrease in daily traffic volume compared to the Proposed Action.

With a short-term construction/demolition increase of 11 percent and a long-term 24.5 percent operational decrease in off-base traffic on Mississippi Avenue in the westbound direction, and a 1.5 percent short-term construction/demolition increase and a 54.7 percent long-term operational decrease in off-base traffic at E470 exit 16, compared to the Proposed Action, Alternative 1 would create a minor off-base traffic impact at the Mississippi Gate.

### **On-Base Traffic**

Since all construction and demolition vehicles required to complete the proposed ADP projects would access Buckley AFB through the Mississippi Gate, on-base traffic traveling north on Aspen Street would increase temporarily. From Aspen Street, the majority of the construction and demolition traffic would travel west to project sites, turning left on Winter Park Avenue (for the Main Gate and North Section of the Dormitory ADP). Portions of the Entry Gates ADP are located directly west of Aspen Street and would be accessed directly from that artery.

The increase in construction and demolition vehicles entering the Mississippi Gate under the worst-case circumstances in 2003 is estimated to be 173 vehicles per day (Table 4.34). Assuming an even distribution of half of these vehicles arriving during the peak morning hour, the existing capability to open and operate two inbound processing lanes would be adequate. On-base road traffic in the vicinity of the Mississippi Gate would be increased by the 173 additional vehicles entering the facility.

The worst-case short-term increase in construction/demolition vehicles entering the Mississippi Gate is estimated to be 173 vehicles per day, while the long-term vehicle increase would be 4,803. Assuming an even distribution of half of the construction and one-third of the commuter vehicles during the peak morning hour the existing capability to open and operate two inbound processing lanes would be adequate. On-base traffic during construction and demolition projects in the vicinity of the Mississippi Gate would be increased by 173 additional vehicles entering the facility and accessing project sites directly off of Aspen Street, traveling west on A-Basin or Winter Park Avenues, or traveling east on Steamboat or Breckenridge Avenues. On-base road traffic in the vicinity of the Mississippi Gate would be increased by the 4,803 additional vehicle trips entering the facility primarily traveling on Aspen and A-Basin Avenues.

#### 4.4.10.7 New Munitions and Hazardous Materials Gate

Similar to the Proposed Action, access to the installation would be limited to airbase operations and maintenance such as munitions and HAZMAT transport.

##### Off-Base Traffic

Off-base traffic under Alternative 1 would be identical to the Proposed Action. Security operations would restrict access through the proposed Munitions and Hazardous Materials Gate limiting to delivery vehicles. Therefore, the potential off-site traffic impacts would not be significant.

##### On-Base Traffic

On-base traffic under Alternative 1 would be identical to the Proposed Action. Delivery vehicle traffic on on-base roadways would not change as a result of this entry gate and no resulting significant on-base traffic impacts would occur.

#### 4.4.10.8 Cumulative Impacts

Incremental increases in traffic volume under Alternative 1 would be similar to the Proposed Action. Alternative 1 would generate nearly 15 percent of the increased traffic volume by the year 2010 (Table 4.35).

Table 4.35: Cumulative Traffic Volume – Alternative 1			
Category	Daily Trips*	AM peak Hour Trips	PM peak Hour Trips
Buckley AFB 2010 Total	79,493	7,579	9,199
Aurora 2010 Total	452,783	22,956	26,058
2010 Total	532,277	30,535	35,257
Percent Change	14.93%	24.82%	26.09%

\* Trip generation rates given per 1,000 square foot of Gross Floor Area, unless otherwise noted (See Appendix H).

Highway and road improvements within the surrounding community would reduce localized traffic congestion. Alternative modes of travel would be increased by the additional bus services and light rail, bike and pedestrian trails planned for the area reducing impacts to am and pm peak

hours. The mixed-use development centers reduce the number of trips and distance traveled to work as a larger percent of the population both live and work in these areas generate fewer traffic impacts.

#### **4.4.10.9 BMPs**

As with the Proposed Action, a construction transportation plan would be needed to minimize potential temporary impacts of construction on the local transportation system. Temporary detours and detour routing would be developed in conjunction with specific project construction schedules to ensure adequate accessibility to occupied facilities.

#### **4.4.11 Water Resources**

If Alternative 1 were followed the impacts on water resources would be decreased to some degree. The actual reduction in impacts to water resources, including surface water, stormwater and groundwater would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced impacts on water resources would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified, however impacts would remain insignificant under Alternative Action 1.

##### **4.4.11.1 Cumulative Impacts**

Cumulative impacts of the Proposed Action on water resources were presented in Section 4.3.11.4. If Alternative Action 1 were followed it is likely that the cumulative environmental impacts on water resources would be diminished by some degree. The actual reduction in impacts associated with Alternative Action 1 would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts on water resources would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing Alternative Action 1 on water resources would be less than those predicted for the Proposed Action and would remain insignificant.

#### **4.4.12 Floodplains and Wetlands**

##### **4.4.12.1 Floodplains**

Similar to the Proposed Action, existing stormwater management ponds would reduce discharges from future development within the Alternative 1 - Privatized Housing, Dormitory, and Entry Gates ADPs. Vegetated filter strips, depressional storage areas, and other open spaces planned throughout these areas would be designed to further reduce the peak rate of discharge from Buckley AFB.

Small amounts of surface flows may not be detained. Site design and BMPs such as temporary silt ponds would be used to minimize any potential indirect adverse effects from increased flows during construction. Therefore, there would be no overall increase in flooding or channel instability in downstream 100-year floodplains.

##### **4.4.12.2 Wetlands**

Disturbance to wetlands, WOUS, and riparian vegetation would be limited to minor surface grading to construct portions of the MFH. Fewer road drainage improvements limit potential impacts to wetlands and WOUS.

No construction of new wetlands is being considered under Alternative 1. If necessary or if project locations change such that impacts may occur, the process of wetland delineation would proceed. USAF policy follows the no net loss of wetlands and where feasible, the quality of the wetland resources would be enhanced without adversely affecting the operational requirements at Buckley AFB. Therefore, no long-term adverse impacts to wetlands are expected from the Alternative 1.

##### **4.4.12.3 Cumulative Impacts**

The phased development and demolition plans under Alternative 1 would reduce the increase in impervious surfaces from 240 to 202 acres, which would be 14 percent less than the Proposed Action. Future flood control measures and drainage systems would be designed to control the peak rate of discharge from developing properties for the 100-year 24-hour event to levels that would not cause an increase in flooding or channel instability downstream when considered in aggregate with other developed properties and downstream drainage capacities.

#### **4.4.13 Radon**

If Alternative 1 were followed the potential to encounter radon would be decreased to some degree. The actual reduction in potential radon exposure would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced potential affects of radon would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified, however impacts would remain insignificant under Alternative Action 1.

##### **4.4.13.1 Cumulative Impacts**

Cumulative impacts of the Proposed Action related to radon were presented in Section 4.3.13.1. If Alternative Action 1 were followed it is likely that the cumulative environmental impacts related to radon would be diminished by some degree. The actual reduction in impacts associated with Alternative Action 1 would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts related to radon would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing Alternative Action 1 related to radon would be less than those predicted for the Proposed Action and would remain insignificant.

#### **4.4.14 Lead-Based Paint**

If Alternative 1 were followed the generation of LBP wastes could be decreased to some degree. The actual reduction in LBP waste generation would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced generation of LBP waste would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified, however impacts would remain insignificant under Alternative Action 1.

##### **4.4.14.1 Cumulative Impacts**

Cumulative impacts of the Proposed Action related to the generation of LBP wastes were presented in Section 4.3.14.1. If Alternative Action 1 were followed it is likely that the

cumulative environmental impacts related to the generation of LBP wastes would be diminished by some degree. The actual reduction in impacts associated with Alternative Action 1 would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts related to the generation of LBP wastes would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing Alternative Action 1 related to the generation of LBP wastes would be less than those predicted for the Proposed Action and would remain insignificant.

#### **4.4.15 Asbestos**

If Alternative 1 were followed the generation of asbestos wastes could be decreased to some degree. The actual reduction in asbestos waste generation would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced generation of asbestos waste would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified, however impacts would remain insignificant under Alternative Action 1.

##### **4.4.15.1 Cumulative Impacts**

Cumulative impacts of the Proposed Action related to asbestos remediation and waste generation and disposal were presented in Section 4.3.15.1. If Alternative Action 1 were followed it is likely that the cumulative environmental impacts related to asbestos remediation and waste generation and disposal would be diminished by some degree. The actual reduction in impacts associated with Alternative Action 1 would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts related to asbestos remediation and waste generation and disposal would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is



not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing Alternative Action 1 related to asbestos remediation and waste generation and disposal would be less than those predicted for the Proposed Action and would remain insignificant.

#### **4.4.16 Noise**

If Alternative 1 were followed noise impacts would be decreased to some degree. Noise as a result of construction activities would be limited to normal, daytime working hours, and would be local, short-term, and minor. There could be very short periods when construction equipment would produce noise of sufficient intensity that the impact could be moderate, but these periods would be limited, and considering the nature of the Airfield and Clear Zone, not entirely unexpected.

The actual reduction in noise generation would be related to the locations, number and extent of projects that would be time-delayed, downsized or not constructed. Noise generation reductions would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified, however impacts would remain insignificant under Alternative Action 1.

##### **4.4.16.1 Cumulative Impacts**

Cumulative impacts of the Proposed Action related to noise were presented in Section 4.3.16.1. If Alternative Action 1 were followed it is likely that the cumulative environmental impacts related to noise impacts would be diminished by some degree. The actual reduction in impacts associated with Alternative Action 1 would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts related to noise impacts would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing Alternative

Action 1 related to noise impacts would be less than those predicted for the Proposed Action and would remain insignificant.

#### **4.4.17 Safety**

Similar to the Proposed Action, Alternative 1 would not result in any changes to Buckley AFB standard work safety practices. Thus, Alternative 1 would not result in significant impacts to safety on Buckley AFB.

##### **4.4.17.1 Cumulative Impacts**

Alternative 1 would take place within the current boundaries of Buckley AFB. Similar to the Proposed Action, interdependent airbase operations and maintenance functions would be consolidated thereby improving the safety and security of the installation and surrounding community.

#### **4.4.18 Pollution Prevention**

Alternative 1 construction and demolition activities would be subject to all pollution prevention programs at Buckley AFB. Implementation would not result in impacts from preventable pollution.

##### **4.4.18.1 Cumulative Impacts**

Concurrent construction projects would be less likely to occur. Compared to the extent of the regional development Alternative 1 would contribute a negligible amount of pollution. These effects would be short-term and localized.

#### **4.4.19 Socioeconomics**

##### **4.4.19.1 Population**

Population under Alternative 1 would be similar to the population effects described for the Proposed Action.

##### **4.4.19.2 Income and Employment**

Construction costs and corresponding labor costs would generate an estimated \$40.5 million less in direct income and \$5.5 million per year of construction activity (an estimated 195 jobs per year) or about 427 fewer jobs per year of construction than the Proposed Action.

#### **4.4.19.3 Housing**

Alternative 1 would provide on-base personnel a quality work environment but there would be less community support services and amenities. There would be a decreased quality of residential life because no residential amenities, fewer ball fields, and no recreation facilities would be constructed. On-base residents would be more likely to use off-base parks and recreational facilities and some retail/commercial services in the surrounding community.

The housing impacts of Alternative 1 would be the similar to the Proposed Action by temporarily reducing the demand for housing within the adjacent community. This alternative would generate fewer community service jobs and reduces discretionary spending on-base as residents seek off-base community goods and services. However residents would be more involved in the local community (community clubs, organizations and religious activities). Recreation and park facilities within the surrounding community could become overcrowded as use increased.

#### **4.4.19.4 Community Redevelopment**

Alternative 1 would create more opportunity for the development of commercial and community retail services and facilities as part of the Fitzsimons or Lowry Redevelopment Areas. Most of the growth in service related jobs would be concentrated within the City of Aurora increasing the business development and contributing to the tax base. This development would remain consistent with the housing and community development objectives of the City of Aurora and Arapahoe County.

#### **4.4.19.5 Cumulative Impacts**

Presently and continuing over the next several years, significant levels of construction and development activities at Fitzsimons will be readily apparent as new educational and research facilities and hospital facilities are built. At Buckley AFB incremental increases in employment would occur, but under Alternative 1 there would be less simultaneous development, resulting in an accelerated slowing of economic effects. The economic and fiscal impacts associated with Alternative 1 construction activity would be relatively short. When the housing and base construction activity slows the effects on the local economy would be maintained by use of off-base community service facilities and business.

## **4.5 NO ACTION ALTERNATIVE**

### **4.5.1 Air Quality**

Under the No Action Alternative, the effects of each Facility Development Project on air quality have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis. This EA assess the cumulative impacts from these projects.

#### **4.5.1.1 Cumulative Impacts**

Cumulative annual emissions increase impacts of the Proposed Action and Alternative Action 1 were presented in Sections 4.3.1.7 and 4.4.1.1, respectively. If the No Action Alternative were followed it is likely that the cumulative environmental impacts on air quality would be diminished from the Proposed Action and Alternative Action 1 scenarios by some degree. The actual reduction in air quality impacts associated with the No Action Alternative would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts on air quality would be calculated on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing the No Action Alternative on air quality would be less than those predicted for the Proposed Action or the Alternative Action 1 and would remain insignificant.

### **4.5.2 Soils**

Under the No Action Alternative, the effects of each Facility Development Project on soils have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis. This EA assess the cumulative impacts from these projects.

#### **4.5.2.1 Cumulative Impacts**

Buckley AFB has been used for military training and development has occurred throughout the installation since the early 1940s. The No Action Alternative would continue current land use patterns and involve construction already authorized under previously authorized FONSI. As such this alternative would have only negligible long-term impacts to soils resulting from the compaction of soils along informal pedestrian trails. These construction activities would contribute to regional soil perturbations accumulated by urban development in the surrounding community.

A few park construction projects in the City of Aurora could potentially affect soils. These activities would involve local, short-term soil alterations associated with site grading and constructing buildings at adjacent light industrial areas. Future transportation improvements and other construction projects would contribute locally to soil loss as a result of an increase in impervious surfaces. Overall, these projects would have a negligible adverse impact on regional soil loss and a minor adverse impact on the local scale. Understood in this context, the No Action Alternative would contribute to regional soil losses, but with the use of conventional soil conservation and best management practices the incremental effect of this alternative would be inconsequential and the adverse cumulative effect would be insignificant.

#### **4.5.3 Hazardous Materials**

Under the No Action Alternative, the effects of each Facility Development Project on hazardous materials have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis. This EA assess the cumulative impacts from these projects.

##### **4.5.3.1 Cumulative Impacts**

Cumulative HAZMAT impacts of the Proposed Action and Alternative Action 1 were presented in Sections 4.3.3.1 and 4.4.3.1, respectively. If the No Action Alternative were followed it is likely that the cumulative environmental impacts created by HAZMAT storage, handling and use would be diminished from the Proposed Action and Alternative Action 1 scenarios by some degree. The actual reduction in impacts created by HAZMAT storage, handling and use associated with the No Action Alternative would be related to the number and

extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts created through HAZMAT storage, handling and use would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing Alternative Action 1 or the No Action Alternative created by HAZMAT storage, handling, and use would be less than those predicted for the Proposed Action or the Alternative Action 1 and would remain insignificant.

#### **4.5.4 Hazardous Wastes**

Under the No Action Alternative, the effects of each Facility Development Project on hazardous wastes have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis. This EA assesses the cumulative impacts from these projects.

##### **4.5.4.1 Cumulative Impacts**

Cumulative hazardous waste impacts of the Proposed Action and Alternative Action 1 were presented in Sections 4.3.4.1 and 4.4.4.1, respectively. If the No Action Alternative were followed it is likely that the cumulative environmental impacts of hazardous wastes generated would be diminished from the Proposed Action and Alternative Action 1 scenarios by some degree. The actual reduction in impacts associated with the No Action Alternative would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts of hazardous waste generation would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of hazardous waste generation associated with implementing the No Action

Alternative would be less than those predicted for the Proposed Action and Alternative Action 1 and would remain insignificant.

#### **4.5.5 Historic Structural Resources**

Under the No Action Alternative, the effects of each Facility Development Project on historic structural resources have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis. This EA assess the cumulative impacts from these projects.

##### **4.5.5.1 Cumulative Impacts**

Cumulative effects of the No Action Alternative would be similar to those described in the Proposed Action. There would be no adverse impact to a historic structural resource whose conservation is necessary to fulfill specific purposes identified in the *Colorado Preservation 2005 Plan* (Colorado Historical Society 2001).

#### **4.5.6 Land Use and Aesthetics/Visual**

Under the No Action Alternative, the effects of each Facility Development Project on land use and aesthetics/visual resources have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis. This EA assess the cumulative impacts from these projects.

##### **4.5.6.1 Cumulative Impacts**

Cumulative effects of the No Action Alternative to land use and aesthetics would be similar to those described in Alternative 1 except that individual Facility Development Projects would be constructed without comprehensively co-locating or consolidating facilities and operations. Residential areas would be exposed to operational and traffic noise. Travel distances and times between residences, offices and public service areas would increase as operational and residential traffic increases and traffic systems are not upgraded. A few focal point-streetscapes and parking areas would be landscaped at the Headquarters Area and MFH areas.

Future development could progress in a manner that would not be compatible with adjacent land uses and aircraft noise contours. This would expose incompatible land uses to increased noise and safety impacts within the Air Force Clear Zone.

#### **4.5.7 Socioeconomics**

Under the No Action Alternative, the effects of each Facility Development Project on socioeconomics have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis. This EA assess the cumulative impacts from these projects..

##### **4.5.7.1 Cumulative Impacts**

In general, cumulative socioeconomic impacts would be similar to Alternative 1 except for slower employment growth contributing less to decreasing unemployment in the immediate community. Available low to moderately priced rental units would decrease as housing projects are completed or underway at the Fitzsimons Redevelopment area. Housing units currently leased by the military could be demolished and redeveloped increasing demand for military family housing. A potential cumulative impact could result if the increased demand for rent comparable, appropriately located housing could not be accommodated by the existing housing supply.

Positive land use aspects of consolidating airbase operation and maintenance facilities in close proximity to each other would not occur. Although there would be some demolition and rehabilitation of existing structures, the dormitory, community service, commercial facilities, and aging infrastructure would remain. On-going maintenance would be provided to the extent that is economically feasible. Socioeconomic impacts would result with the increasing cost of maintaining deteriorating airbase operations facilities.

#### **4.5.8 Utilities**

Under the No Action Alternative, the effects of each Facility Development Project on utilities have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis. This EA assess the cumulative impacts from these projects.



#### **4.5.8.1 Cumulative Impacts**

Cumulative impacts of the Proposed Action and Alternative Action 1 on utilities were presented in Sections 4.3.8.6 and 4.4.8.1, respectively. If the No Action Alternative were followed it is likely that the cumulative environmental impacts on utilities would be diminished from the Proposed Action and Alternative Action 1 scenarios by some degree. The actual reduction in impacts associated with the No Action Alternative would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts on utilities would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing the No Action Alternative on utilities would be less than those predicted for the Proposed Action and Alternative Action 1 and would remain insignificant.

#### **4.5.9 Biological Resources**

Under the No Action Alternative, the effects of each Facility Development Project on biological resources have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis. This EA assess the cumulative impacts from these projects.

##### **4.5.9.1 Cumulative Impacts**

Cumulative impacts of the Proposed Action and Alternative Action 1 on biological resources were presented in Sections 4.3.9.5 and 4.4.9.5, respectively. If the No Action Alternative were followed it is likely that the cumulative environmental impacts on biological resources would be diminished from the Proposed Action and Alternative Action 1 scenarios by some degree. The actual reduction in impacts associated with the No Action Alternative would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts on biological resources would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be

quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing the No Action Alternative on biological resources would be less than those predicted for the Proposed Action and Alternative Action 1 and would remain insignificant.

#### **4.5.10 Traffic/Transportation**

Under the No Action Alternative only the new on-base housing addressed under other EAs (See Table 2.21) would be constructed. These EAs are incorporated in the CIP EA by reference and do not require further environmental analysis. In addition, no improvements to existing roadways within the base would be made and thus no changes to street grids or improvements to the internal circulation along the primary and secondary roads would be realized.

Since no construction or demolition related to this EA would be conducted through the No Action Alternative, no increases or traffic impacts would occur in comparison to the Proposed Action and Alternative Action 1 scenarios related to those activities.

##### **4.5.10.1 ADP Trip Generation**

Trip generation resulting from the No Action Alternative is estimated based on no new housing units, redevelopment or expansion of other community commercial, service, or light industrial facilities associated with the Proposed Action and Alternative Action 1 scenarios. Trip generation associated with the No Action Alternative land uses was estimated using ITE trip generation rates. Housing and dormitory trip rates per unit assumed in the Proposed Action and Alternative Action 1 analysis were also assumed for the No Action Alternative.

For purposes of this analysis, it was assumed that up to 90 percent of the vehicle trips generated by the community commercial, service and light industrial facilities would be generated by patrons or employees coming to and from areas outside of the project site. The remaining 10 percent were assumed to be related to on-site residents. If the No Action Alternative were implemented no community service area improvements would be made, and therefore, no housing units would be located within walking distance of these community

facilities. For this reason no trips were deducted from the 10 percent of non-housing generated trips.

Table 4.36 summarizes the estimated new net trip generation for No Action Alternative. The No Action Alternative would generate considerably more vehicle trips than the Proposed Action because fewer individuals would be living on-base.

<b>Table 4.36: Traffic Volume Impact – No Action Alternative</b>			
<b>Category</b> <sup>(1, 2)</sup>	<b>Daily Trips</b> <sup>(3)</sup>	<b>AM peak Hour Trips</b>	<b>PM peak Hour Trips</b>
ELU Baseline <sup>(4)</sup>	65,493	6,244	7,401
No Action Alternative Trips	29,468	1,936	2,450
Total 2010 Trips	94,961	8,180	9,851
Percent Impact	44.99%	31.01%	33.10%

- (1) Calculation spreadsheet provided in Appendix K.
- (2) Based on total market rate multi-family housing (ITE LU 230) and single family housing (ITE LU 210); community commercial (ITE LU 814); community service (ITE LU 495); Research and Development (Buckley AFB administrative) (ITE LU 760); and light industrial (ITE LU 110).
- (3) Trip generation rates given per 1,000 square foot of Gross Floor Area, unless otherwise noted (See Appendix K).
- (4) Based on existing land use acreage and 1 percent growth rate per year to 2010.

By comparing total traffic volumes for the 2010 ELU baseline and additional vehicle trips generated by No Action Alternative, the percent traffic impact would increase approximately 45 percent. But compared to the Proposed Action, the No Action Alternative total daily traffic trip volumes would increase by 4,989 a 20.4 percent increase.

There would be no upgrades to the internal pedestrian connections or expanded community services under the No Action Alternative. Housing would not be located within walking distance of the community facilities. Therefore, a higher number of vehicle trips would be generated by personnel and residents coming to and from the existing on-base, and off-base community service facilities during peak hours. During the am peak hour there would be 62 more trips, 3.3 percent greater than the Proposed Action. During the pm peak hour, there would also be a 3.0 percent increase in traffic impact generated by the No Action Alternative, compared to the Proposed Action. Average peak hour traffic delays would increase as compared to the Proposed

Action. At all other intersections increased delays would be expected due to the additional traffic.

#### **4.5.10.2 Alternative Transportation**

No improvements to sidewalks along streets or pedestrian trails would be provided through the No Action Alternative. No enhancements to promote bike or pedestrian traffic would be made.

#### **4.5.10.3 Installation Transportation**

No new or reconstructed Community Commercial and Service, Industrial, and Housing developments would be constructed through the No Action Alternative.

Vehicular traffic would continue to access the installation through the Main Gate and Telluride Street Gates. The new Munitions and Hazardous Materials Gate would not be constructed to improve future access to Steamboat Avenue for vehicles delivering these materials. The West Gate would not be constructed.

#### **4.5.10.4 Main and Telluride Gates**

##### **Off-Base Traffic**

It was assumed that 90 percent of the additional traffic created by the No Action Alternative would be off-base personnel that enter the base through the Main and Mississippi Gates. The remaining 10 percent of vehicle trips would be on-base personnel.

Approximately 968 new vehicle trips would enter the Main Gate during the peak morning hour. The Main Gate would see a total of approximately 4,090 peak morning hour inbound vehicle trips in 2010, an increase of 31.0 percent over projected 2010 traffic.

The number of vehicles traveling during the peak evening traffic hour west of the Main and Telluride Gates, on 6<sup>th</sup> Avenue, is projected to be approximately 2,775 vehicles during the peak hour. Assuming that three-quarters of the total 1,225 additional daily vehicle trips exiting the base during the peak evening traffic hour travel west, this number would increase to approximately 3,694 vehicles at the peak hour, a 33.1 percent increase over predicted 2010 traffic volumes. Assuming that the remaining one-quarter, or 306 additional vehicles exiting the base during the peak evening traffic hour travel east, this number would increase to approximately 1,231 vehicles per hour, a 33.1 percent increase over predicted 2010 traffic

volumes and a 3.0 percent increase from the Proposed Action. Off-base traffic at the new Telluride Gate would not be expected to be impacted significantly by the No Action Alternative, as this gate is primarily used to access the BX and Commissary.

Traffic proceeding to the base from E-470 exit 19 would turn east or west off the exit ramp on 6<sup>th</sup> Avenue Parkway, and travel south on Gun Club Road or Picadilly Road. From Gun Club Road, traffic would travel east on Bayaud Avenue, turning left onto Picadilly Road (south). Southbound traffic on Picadilly Road would turn right (northeast) on state Highway 30 (which turns into 6<sup>th</sup> Avenue) and access the Main Gate. Assuming that one-quarter of all new traffic using the Main Gate daily would exit and enter the base to and from the east, and all of this traffic would be assumed to travel on E-470, traffic flow at exit number 19 would increase by 3,684 vehicles per day. The Buckley AFB contribution to entrance exit flow at E-470 exit number 19 would be 61.8 percent of total flow. Compared to the Proposed Action, the No Action Alternative produces 20.38 percent increase in daily traffic volume.

With a 33.1 percent increase in off-base peak hour traffic on 6<sup>th</sup> Avenue in both the east and westbound directions, and Buckley AFB contributing 61.8 percent of daily trips at E-470 exit 19, the No Action Alternative would create a significant increase in off-base traffic at the Main Gate.

### **On-Base Traffic**

The increase in vehicles entering the Main Gate is estimated to be 14,734 vehicles per day. However, assuming an even distribution of vehicle trips during the peak morning hour, the increase in traffic entering the Main Gate would increase from 3,122 to 4,054 (a 30.0 percent increase).

Since under the No Action Alternative 6<sup>th</sup> Avenue would not be widened, the capability to open and operate two inbound processing lanes on Aspen Street may not adequately reduce off-base traffic impacts to 6<sup>th</sup> avenue. On-base road traffic in the vicinity of the Main Gate would increase by the 14,734 additional vehicles entering the installation (primarily traveling on Aspen Street). Since no roadway improvements would occur under the No Action Alternative at the Main Gate or Aspen Street may not provide adequate improvement to accommodate the increased peak hour traffic flow. Traffic flow at several intersections would be delayed during peak am and pm hours. There would be a reduced capacity to handle this additional traffic.

#### **4.5.10.5 Mississippi Gate**

##### **Off-Base Traffic**

Under the No Action Alternative 14,734 new vehicle trips would enter the base through the Mississippi Gate daily. The Mississippi Gate would see a total of approximately 968 additional peak morning hour inbound vehicle trips in 2010, an increase of 20.0 percent. Assuming that three-quarters of the total 1,225 additional vehicles exiting the base during the peak evening traffic hour travel west, the number of vehicles traveling west on Mississippi Avenue would increase to approximately 3,694 vehicle trips per hour. This is a 3.0 percent increase in traffic volume over the Proposed Action.

Assuming that one-quarter of all commuter traffic would exit and enter the base to and from the east, and all of this traffic would travel on E-470, traffic flow at exit number 16 would increase by 3,684 vehicles per day. The No Action Alternative would produce a 20.4 percent increase in daily traffic volume compared to the Proposed Action.

With a long-term 31 to 33 percent operational increase in off-base traffic on Mississippi Avenue in the westbound direction, and a 20.4 percent long-term operational increase in off-base traffic at E470 exit 16, compared to the Proposed Action, the No Action Alternative could create a significant off-base traffic impact at the Mississippi Gate.

##### **On-Base Traffic**

Since no construction or demolition projects would be conducted as part of the No Action Alternative, contractor construction, demolition, or contractor employee vehicles would not be accessing Buckley AFB through the Mississippi Gate.

The long-term vehicle increase entering the Mississippi Gate is estimated to be 14,734 vehicles per day. Assuming an even distribution of one-third of the commuter vehicles during the peak morning hour the existing capability to open and operate two inbound processing lanes may not be adequate. On-base road traffic in the vicinity of the Mississippi Gate would be increased by the 14,734 additional vehicle trips entering the facility primarily traveling on Aspen and A-Basin Avenues.

#### **4.5.10.6 New Munitions and Hazardous Materials Gate**

Under the No Action Alternative the New Munitions and Hazardous Materials Gate would not be constructed. Therefore, the on-base and off-base traffic patterns used currently for deliveries of these materials would continue as existing.

#### **On-Base Traffic**

The current circumstance where HAZMAT deliveries are entering the facility adjacent to a residential area would continue under the No Action Alternative. The potential for spills or other incidents related to delivery of HAZMATs in or around residential areas, presenting potential direct and indirect positive effects would remain under this option.

#### **4.5.10.7 Cumulative Impacts**

Cumulative impacts on traffic/transportation under the No Action Alternative would result from the continuation of personnel commuting to the base from off-base residences, as described above throughout Section 4.5.10. This impact could create a circumstance where the No Action Alternative cumulative environmental impacts on traffic would be increased from the Proposed Action and Alternative Action 1 scenarios by some degree (see Section 4.5.10). However, overall No Action Alternative cumulative impacts on traffic would be related to the number and extent of projects within the City of Aurora that would be time-delayed, downsized or not constructed. The reduced cumulative impacts on traffic would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing the No Action Alternative on water resources would be less than those predicted for the Proposed Action and Alternative Action 1.

#### **4.5.11 Water Resources**

Under the No Action Alternative, the effects of each Facility Development Project on hazardous materials have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). These EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental

analysis. The cumulative effects of all these projects that are currently being evaluated are addressed in this EA.

#### **4.5.11.1 Cumulative Impacts**

Cumulative impacts of the Proposed Action and Alternative Action 1 on water resources were presented in Sections 4.3.11.4 and 4.4.11.1, respectively. If the No Action Alternative were followed it is likely that the cumulative environmental impacts on water resources would be diminished from the Proposed Action and Alternative Action 1 scenarios by some degree. The actual reduction in impacts associated with the No Action Alternative would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts on water resources would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing the No Action Alternative on water resources would be less than those predicted for the Proposed Action and Alternative Action 1 and would remain insignificant.

#### **4.5.12 Floodplains and Wetlands**

Under the No Action Alternative, the effects of each Facility Development Project on floodplains and wetlands have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). These EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis. The cumulative effects of all these projects that are currently being evaluated are addressed in this EA.

#### **4.5.12.1 Cumulative Impacts**

Cumulative effects of the No Action Alternative would be similar to those described for Alternative 1.

#### **4.5.13 Radon**

Under the No Action Alternative, the effects of each Facility Development Project on radon have already been addressed under other EAs (See Table 2.21a) and/or are being prepared



concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis. This EA assesses the cumulative impacts from these projects.

#### **4.5.13.1 Cumulative Impacts**

Cumulative impacts of the Proposed Action and Alternative Action 1 related to radon were presented in Sections 4.3.13.1 and 4.4.8.1, respectively. If the No Action Alternative were followed it is likely that the cumulative environmental impacts would be diminished from the Proposed Action or Alternative Action 1 scenarios by some degree. The actual reduction in impacts associated with the No Action Alternative would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts related to radon would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing No Action Alternative related to radon would be less than those predicted for the Proposed Action and Alternative Action 1 and would remain insignificant.

#### **4.5.14 Lead-Based Paint**

Under the No Action Alternative, the effects of each Facility Development Project on lead-based paint have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis. This EA assesses the cumulative impacts from these projects.

#### **4.5.14.1 Cumulative Impacts**

Cumulative impacts of the Proposed Action and Alternative Action 1 were presented in Sections 4.3.14.1 and 4.4.9.1, respectively. If the No Action Alternative were followed it is likely that the cumulative environmental impacts related to the generation of LBP wastes would be diminished from the Proposed Action and Alternative Action 1 scenarios by some degree. The actual reduction in impacts associated with the No Action Alternative would be related to

the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts related to the generation of LBP wastes would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing the No Action Alternative related to the generation of LBP wastes would be less than those predicted for the Proposed Action and Alternative Action 1 and would remain insignificant.

#### **4.5.15 Asbestos**

Under the No Action Alternative, the effects of each Facility Development Project on asbestos have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis. This EA assess the cumulative impacts from these projects.

##### **4.5.15.1 Cumulative Impacts**

Cumulative impacts of the Proposed Action and Alternative Action 1 related to asbestos remediation and waste generation and disposal were presented in Sections 4.3.15.1 and 4.4.10.1, respectively. If the No Action Alternative were followed it is likely that the cumulative environmental impacts would be diminished from the Proposed Action or Alternative Action 1 scenarios by some degree. The actual reduction in impacts associated with the No Action Alternative would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts related to asbestos remediation and waste generation and disposal would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing the No

Action Alternative related to asbestos remediation and waste generation and disposal would be less than those predicted for the Proposed Action and Alternative Action 1 and would remain insignificant.

#### **4.5.16 Noise**

Under the No Action Alternative, the effects of each Facility Development Project on noise have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis. This EA assesses the cumulative impacts from these projects.

##### **4.5.16.1 Cumulative Impacts**

Cumulative of the Proposed Action and Alternative Action 1 related to noise were presented in Sections 4.3.16.1 and 4.4.11.1, respectively. If the No Action Alternative were followed it is likely that the cumulative environmental impacts would be diminished from the Proposed Action or Alternative Action 1 scenarios by some degree. The actual reduction in impacts associated with the No Action Alternative would be related to the number and extent of projects that would be time-delayed, downsized or not constructed. The reduced cumulative impacts related to noise impacts would be determined on a project by project basis, as details related to time-delays, downsizing or elimination are known and can be quantified. The circumstance would be similar for City of Aurora development projects that may be time-delayed, downsized or not constructed. At this time it is not possible to predict the degree or extent that City of Aurora development may be time-delayed, downsized or not constructed. However, it is reasonable to assume that overall cumulative impacts of implementing the No Action Alternative related to noise impacts would be less than those predicted for the Proposed Action and Alternative Action 1 and would remain insignificant.

#### **4.5.17 Safety**

Under the No Action Alternative, the effects of each Facility Development Project on safety have already been addressed under other EAs (See Table 2.21a) and are currently being addressed in EAs that are being developed concurrently. The EAs that resulted in a FONSI EAs are incorporated in the CIP EA by reference and do not require further analysis. The safety concerns related to the current practice of receiving munitions and HAZMATs entering the

facility adjacent to a residential area would continue under the No Action Alternative (see Section 4.5.10.6). Under the No Action Alternative the potential for spills or other incidents related to delivery of munitions and HAZMATs in or around residential areas, presenting potential direct and indirect negative effects would remain.

#### **4.5.17.1 Cumulative Impacts**

Cumulative effects of the No Action Alternative would be similar to those described for the Proposed Action, with the exception that the current practice of receiving munitions and HAZMATs entering the facility adjacent to a residential area would continue under the No Action Alternative (see Sections 4.5.10.6 and 4.5.17).

#### **4.5.18 Pollution Prevention**

Under the No Action Alternative, the effects of each Facility Development Project on pollution prevention have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI are incorporated in the CIP EA by reference and do not require further environmental analysis.

The pollution prevention concerns related to the current practice of receiving munitions and HAZMATs entering the facility adjacent to a residential area would continue under the No Action Alternative (see Section 4.5.10.6). Under the No Action Alternative the potential for spills or other incidents related to delivery of munitions and HAZMATs in or around residential areas, presenting potential direct and indirect negative effects would remain.

#### **4.5.18.1 Cumulative Impacts**

Cumulative effects of the No Action Alternative would be similar to those described for the Proposed Action, with the exception that the current practice of receiving munitions and HAZMATs entering the facility adjacent to a residential area would continue under the No Action Alternative (see Sections 4.5.10.6 and 4.5.17).

#### **4.5.19 Environmental Justice**

Under the No Action Alternative, the effects of each Facility Development Project on environmental justice have already been addressed under other EAs (See Table 2.21a) and/or are being prepared concurrently with this EA (See Table 2.21b). The EAs that resulted in a FONSI

are incorporated in the CIP EA by reference and do not require further environmental analysis. This EA assess the cumulative impacts from these projects.

#### **4.5.19.1 Cumulative Impacts**

Cumulative impacts on environmental justice under the No Action Alternative would be limited to the impacts of development within the City of Aurora. Safeguards to insure that development would not impact minority/low-income populations, such as zoning area use designations, laws and permitting requirements. Additional details related to these mechanisms were provided in Section 4.3.19.1.

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## **SECTION 5**

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## SECTION 6

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## **SECTION 7**

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